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ABSTRACT

This research report presents the findings of an evaluation of the compensatory education program at El Paso Community College, Colorado Springs, Colorado, which has been in existence for six years. The results of scores made on admission tests were used to determine whether entering students were functioning at the college level. Students with low scores were placed in appropriate remedial-compensatory or skills courses in reading, English, or mathematics. Independent researchers concluded that the placement instruments for mathematics, English, and reading (SRA Diagnostic Reading Test) have high reliability and moderate validity. Other conclusions were that a significant proportion of entering students do have functioning levels which warrant the existence of the remedial-compensatory courses; that students who take one or more skills courses are competitive with students whose placement scores allow them to take college level courses immediately; that success in academic courses is not dependent upon age, ethnic background, major, student type, employment, financial status, or residency, although women students were found to be higher achievers; and that the cost of educating a basic skills student is 62.5% of the college level student instructional cost. (MKM)

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El Paso Community College
Colorado Springs, Colorado

Dr. Donald W. McInnis, President

the Second Chance

EPCC's program to meet the needs of disadvantaged students through remedial-compensatory education

John Rodwick
Michael J. Grady

February 1, 1976

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Cover photo: Molly Sumner, math instructor, skills department.

CS 002 493

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FOREWORD

I am pleased to present this report of the findings of the recent study done at El Paso Community College within our Skills Program. The development of "remedial" programs in the contemporary community college has produced an overwhelming need for documentation of our efforts. Produced at the suggestion of those associated with the El Paso Community College Skills Program, this document will provide significant information and statistics in this area.

I would like to thank all those who contributed time and effort in the research as well as in the production of this document. It is through such efforts of dedicated professionals that we will better serve generations to come.

It is my hope that this document will produce added support within the state of Colorado for meeting the needs of adults who have, for one reason or another, been unable to receive those skills so necessary for success in our society.

Donald W. McInnis, President
February 1, 1976

PREFACE

With its beginnings in 1969, El Paso Community College (EPCC) wrote into its statements of purpose a goal allowing any student who could benefit from instruction an opportunity to enter its open door. Consistent with that purpose, the college took upon itself the responsibility of providing a program of remedial-compensatory education for those students requiring preparatory work in English, mathematics, and reading as prerequisites to transfer and career programs.

In the past six years the program has grown from one reading instructor to over twenty full- and part-time faculty, teaching every level of those elementary and secondary basic learning skills. The Skills Studies faculty prides itself in working with over 2,000 different persons every academic year in a program, one of Colorado's largest, that offers its students a wide variety of teaching methods and approaches. Even though the program has been successful in terms of student-teacher satisfaction and continuous enrollment demands, only minimal effort has been expended attempting to show with significant objectivity the real need for remedial-compensatory education at EPCC and the effect of this program on transfer and career program courses.

The stimulus to review this program came in late June 1975 when EPCC's President, Don McInnis, received a memorandum from Bill Adrian, Deputy Director for the Colorado Commission on Higher Education (CCHE). The letter read, in part:

> The Commission has been directed by the Joint Budget Committee (JBC) to require institutions to identify remedial instruction as a separate program distinct from resident instruction in budget requests for 1976-77. It is important for CCHE to understand the area of remedial instruction as implemented by the public postsecondary educational institutions in Colorado and to be fully informed on types of remedial instruction.

The letter went on to note that Lila Engdahl, a University of Colorado doctoral student and former Community College of Denver council member, would be gathering baseline information on remedial instruction as part of a CCHE internship. Her report was completed in September, and portions are referenced in this study.

Although the Engdahl (1975) report, as an overview of remedial instruction in Colorado's institutions of higher education, will be valuable to members of CCHE and Colorado's Joint Budget Committee (JBC), it remains the responsibility of each Colorado institution of higher education to describe in greater detail its compensatory programs and to select means of determining program need and effectiveness as a way of demonstrating reasons for continued existence and funding.

At El Paso Community College, we felt it was important not only to develop our own research model and subsequent study but also to coordinate our efforts with other Colorado community colleges. In mid-July, 1975, a letter was sent to the other ten, two-year colleges inviting them to meet at Arapahoe Community College on August 5 "...to engage in discussions relative to meeting the request identified by CCHE and the JBC and show that remedial instruction is a justifiable and integral part of our community college program." Only five colleges sent representatives. Of those, only El Paso Community College demonstrated a commitment of personnel and budget to conducting the needed research.

This study reflects that commitment. It also reflects the cooperation of President McInnis and Dean Dale Traylor who recognized the urgency of this study and authorized hiring an independent research firm who could conduct the data analysis section of this study without prejudice. The cooperation from EPCC staff--Wilma Newcomer, Perry Littleton, Paul

Le Beau, Helen Bagherian, Mary Traylor, Willis Belford, Helen Anderson, Sharon Burt, Eura Carter, Robert Chavez, Sharon Franklin, and Gloria Burkhart--was welcomed and appreciated. Special thanks are due to Louis Coffin and Dale Watts, both from the University of Colorado, Colorado Springs, whose data processing assistance was a substantial contribution to this study. The special efforts of Skills faculty--Katherine Anderson, Joyce Armstrong, and Molly Sumner--must be likewise noted,for their willingness to read the technical volume and write the Summary Report was deeply appreciated. Finally, the assistance and support of the Skills faculty constituted the encouragement toward excellence that this study represents.

John Rodwick, Ph. D.
Chairman, Skills Studies Department

Michael J. Grady, Ph. D.
Vice President, Grady Research Associates

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CHAPTER I

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

Summary

At El Paso Community College (EPCC), entering students are required, unless waived, to take placement examinations in mathematics, English, and reading before receiving their initial educational counseling. The Mathematics Placement Test Battery has been locally prepared to measure the student's ability to deal with the manipulation of whole numbers, fractions and their decimal equivalents, and first and second year algebraic concepts and procedures. The English Placement Test requires the entering student to write a short theme on a topic of his choosing. The theme is then evaluated in terms of organization, rhetoric (literary organization, transitions, and support), mechanics, and grammar. Students are also required to take the Science Research Associates Diagnostic Reading Test* which measures reading speed, comprehension, vocabulary, and reading efficiency. (Six academic years have elapsed since El Paso Community College opened its doors to students. The Mathematics Placement Test Battery has undergone one major revision, but the other two tests have remained relatively intact.)

Using scores made on these admission tests, EPCC counselors place students into these courses for the first quarter. When their scores suggest that students are not functioning at the college level, counselors place those students into appropriate remedial-compensatory or skills courses in order to upgrade their academic functioning level.

This study was designed to provide answers to five questions. First, how valid and reliable are the EPCC placement tests? Second, are remedial-compensatory courses needed by entering EPCC students, and what is the cost of providing this program? Third, if a student completes a remedial-

*Form A, Grades 7-College Freshman

compensatory course sequence, can he be successful in core courses such as the 100-level course in mathematics or English in his academic major? Fourth, are such factors as age, sex, ethnic characteristics, and EPCC major related in any way to success in remedial-compensatory and 100-level courses in mathematics, English, and reading? Fifth, is student success in remedial-compensatory and 100-level courses related in any meaningful way to other variables such as pupil type (civilian, military-in-service, or VA and VA dependents), employment status at enrollment (fully employed, part-time employed, or not employed), financial status (socially and economically disadvantaged, physically handicapped, mental/emotionally disadvantaged, combination of the above, and none), and residency status (in-state or out-of-state)?

To answer the reliability portion of the first question (the preliminary study), a sample of 75 students from each of the six years was randomly selected, and the reliability coefficients of the mathematics and reading placement tests were determined. Utilizing the reliability sample, the extent of student need for one or more remedial-compensatory courses was determined for Fiscal Years (FY) '73 through '75. The student need data also were extended to include the fall quarter for FY '76 (question two). Since actual remedial-compensatory student FTE data were available for these years, the per cent of EPCC Skills courses servicing these needs also was calculated. Finally, since budgetary data also were available, costing information was computed for the remedial-compensatory program (EPCC's Skills Studies Department) and compared with total institutional student FTE cost/student information.

For the major study, an approximate 10% sample of students from the spring quarter's registration for the last three academic years was randomly selected by student Social Security account numbers. Data were

gathered on over 1400 students on the following variables: sex, age, ethnic characteristics, years of formal education, years since high school graduation, major department in which enrolled at EPCC, residency status, tuition status, financial status, and grades made in compensatory or 100-level courses in mathematics, English, and reading. Alpha course grades were quantified according to the following arbitrary scale: A=95, B=85, C=75, and D=65. Since grades of U (unsatisfactory - no quality points) and W (withdrawal - no quality points) are not penalty grades at EPCC, no quantitative equivalent was assigned to them.

The validity component of question one was determined by correlating the placement scores and other admissions data with student course grades earned in compensatory and 100-level courses.

The major study also was concerned with the answers to questions three, four, and five.

An ancillary set of comparisons was made separately for the resolution of question five which dealt with the relationship between student success in remedial-compensatory and 100-level courses and such variables as pupil type, employment status at enrollment, financial status, and student residency.

Conclusions

1. The placement instruments for mathematics, reading, and English have high reliability and moderate-level validity.
2. The prediction of academic success in compensatory and 100-level courses using the placement tests could be enhanced through multiple regression techniques.
3. Based on an analysis of placement tests results, a significant proportion of EPCC entering students have functioning levels in mathematics, reading, and English below the college level which warrant the

existence of remedial-compensatory (Skills) courses at EPCC.

4. The cost of educating an EPCC Skills student is 62.5% of the institutional cost per student at El Paso Community College.
5. EPCC students who take one or more Skills courses are competitive with students whose placement scores allow them to take 100-level courses immediately.
6. Students with greatest need for EPCC Skills courses can have these needs satisfied within one calendar year, assuming they register for these courses.
7. As mutually exclusive variables, age, ethnic background, EPCC major, student type, employment, financial status, and residency are not related significantly to grades in compensatory or 100-level courses. In other words, success at EPCC is independent of these factors with one exception. Sex status, as a significant variable, demonstrated that EPCC women students are higher achievers academically.

Recommendations

It is recommended that:

1. Modification be made to the 80-item Mathematics Placement Test Battery to generate a 50-item instrument. This shortened version will reduce testing time without a significant loss in reliability. Also, modification should be made to the present English placement procedures to develop a quantifiable rating scale.
2. The vocabulary and reading comprehension scores be used in combination with the Reading RC score to predict compensatory and 100-level course success in reading, mathematics, and English. It is further recommended that such variables as formal education at admission, years since high school graduation, and sex of students be employed in the

various prediction equations.

3. The Skills Department be funded to serve more students in need of reading, mathematics, and English pre-college skills.
4. The present scope and sequence of Skills courses at EPCC be continued and reviewed annually to maintain relevance of course content to varying student needs.
5. The present EPCC Skills curricular package be made available as a possible model for other community-junior colleges for incorporation into their respective remedial-compensatory programs.
6. The state sponsor an annual skills workshop. The purpose would be to provide an environment where problems and successful techniques in skills teaching could be shared by professionals representing the participating institutions. Perhaps contingency funds from the State Board for Community Colleges and Occupational Education could be used to defray the workshop expenses. The site of each annual workshop could be determined on a rotating basis.
7. Alternative methodologies be explored to further improve program effectiveness and efficiency.

CHAPTER II

STATEMENT OF PURPOSE

Introduction

Community Colleges have provided an educational service to Americans for more than seventy-five years. Responsive to individual needs, and accepting of differing individual abilities, this movement with 1,203 institutions and over 3.5 million students (Drake, 1975) has had a dynamic impact on the lives of millions. Never reserved only for the elite, these educational, lifelong learning programs have reached all ages and all social-economic strata. In today's ever changing world, these programs are more important than ever. Cass (1975) succinctly capsules this point:

> In the past few years...all the distractions and diversions of contemporary life have not inhibited the flowering of new interest in the concept of "lifelong learning." In part it has been sparked by the requirements of a rapidly changing society, the necessity for updating professional and vocational knowledge and skills, and the need to acquire new ones. But for many this interest also represents a basic need to escape the routine of a highly structured environment --to give vent to the unexplored capacities and interest of minds that seek refreshment and renewal through active learning. It appears that we may be on the brink of a new era in education that will transform the nation into a "learning society."

Community colleges are committed to this belief, and their programs are oriented to those who would profit from their services. As "open door" institutions, community colleges are "second chance" opportunities for many of their students (Mayo, 1970)--students whom Cyril O. Houle, professor of education at the University of Chicago, sees as "a new majority" (Hechinger, 1975).

The opportunity for continuing education is being seized by young and old alike. Professionals and skilled technicians faced with updating, retraining, early retirement, or boredom are seeking new interests and

skills to prevent stagnation (Hechinger, 1975). Active-duty military personnel and recent high school graduates faced with new job or promotion requirements are seeking basic instructional programs that will increase their chances for choice new positions or on-the-job advancement.

This resurgence of interest has and will continue to have an impact on community college enrollments, especially those in urban areas. Five years ago, an enrollment of 2.5 million community college students represented 41% of all post-secondary enrollments nationally. In 1972, the community college population of nearly 2.9 million students equalled the total enrollment in higher education in 1945 (Fahrer/Michelich, 1974), and in 1974 this population increased to over 3.5 million (Davis, 1974). In Colorado, where the community college system only had its beginnings in 1967, approximately 25% of all higher education students in that state were enrolled in two-year colleges for 1975 (CCHE, 1975). Although trends are hard to project, there are substantial indications that the "new majority" will continue its desire for "lifelong learning" and thus increase the demands for admission to community colleges.

Attracting and retaining these students will be a function of offering programs that meet their needs. This, however, creates a substantial problem for the community college. As more and more enter the "open door," there will be an increase in the number of students who are not capable of immediately pursuing rigorous academic or technical programs. Medsker and Tillery (1971) and Roueche and Kirk (1973) have already acknowledged this trend. Davis (1974) projects,"by 1975-80, 25 to 30 per cent of all full-time equivalent students will be enrolled in developmental and personal interest curricula." Schultz (1974) estimates that at least 10% of the community college student body will be enrolled in remedial-compensatory programs designed to assist the academically under-prepared. At El Paso Community College, where the Skills Studies Program enrolls approx-

imately 12% of the student body, Schultz's estimate seems accurate.

Although some may believe it reasonable to close the door to some of these students, such action would violate the "open door" community college philosophy. Moore (1971) notes: "If the administrator fails to establish equal priority for the developmental student as he does for the transfer or career student, he is in effect saying to that developmental student, 'You are less important than [other]... students in this college'" (pp. 127-128). Engdahl (1975) likewise supports programs for these students, and in a recent interview one college administrator stated, "If funding were to disappear completely and the college were forced to close down, the last area to be abandoned would be remedial instruction because it is so basic to the other programs" (p. 7).

Assuming that community colleges continue their commitment to the "new majority" and to those who need remedial-compensatory programs, then it is incumbent upon community college staff and legislative budget committees to insure that the open door does not become a revolving door. In the late 60's there was extensive criticism of community colleges that admitted high-risk, low achieving students and failed to provide the much needed remedial programs. Roueche (1968) showed that over 75% of low achievers withdrew from community colleges during their first year and that only 55% of these colleges had remedial programs for low achievers. Although this situation has improved (Roueche and Kirk, 1973), it is important to note there are still institutions which, for lack of any compensatory programs, have caused the open door to revolve and exit those who sought the help which only a community college could offer. Marchbanks (1974) supports this argument and claims that community colleges misrepresent themselves when they imply the promises of an open door commitment and

don't follow through. She states:

> If the community college is to meet the commitment made to students via the open door policy and recruitment of high-risk students, it must prepare itself to diagnose the needs of students, prescribe remediation for those needs, evaluate student progress, and, if necessary, recycle students to overcome learning disabilities (p. 18].

The state of Colorado and its member institutions of higher learning are in varying degrees committed to this concept. Engdahl (1975) found various forms of remedial instruction in every post-secondary campus in Colorado; she also found that existing programs are most often designed to remedy deficiencies in English, mathematics, and reading. She notes that the type of program offered is determined by the mission and role of the institution:

> In all two year colleges as a result of the open-door admissions policy the educational background of students ranges from those persons who may have never had an opportunity to learn even the most basic skills to students with previous college experience. The purposes of programs of a remedial nature is to meet the needs of those students with educational deficiencies so each student may move toward his educational goal (p. 1).

This "new majority" for Colorado's community colleges are usually high school graduates and others with similar qualifications who are 18 years old or over. This condition is also expressed by Engdahl:

> Any citizen of post-high school age or older may enter one of the institutions and be provided with educational opportunity that lies within his range of interest and ability. This guarantees the "right to try" regardless of age or past academic achievement patterns (p. 6).

El Paso Community College (EPCC), a member of Colorado's higher education institutions, is committed to the ideals expressed by Marchbanks (1974) and Engdahl (1975). As stated in EPCC's 1974-75 Annual Report on Instruction, "the primary mission of...the College is to meet the specific educational and manpower needs of the [geographic] area served by the in-

stitution. In keeping with this responsibility, EPCC's instructional program is designed: to prepare students for employment in vocational fields; to upgrade occupational skills; to remedy educational deficiencies; and, to fulfill lower division requirements necessary for transfer to senior colleges and universities."

Since its beginning in 1969, EPCC has continuously striven to meet these stated goals, of which remedial instruction has always been a part. In fact, the support for remedial-compensatory education has been so profound that to eliminate or reduce the size of the program would seriously affect the quality education offered to transfer and career students. So great an importance is placed on this program that its continued development is included in the future instructional plans of the college (Annual Report, 1974-75).

In summary, we find that "lifelong learning" has become a prime interest of the "new majority." These students will find the community college doors open; they will remain students so long as there are programs to meet their needs. A requisite program to meet the needs of those underprepared academically has been generally labeled developmental, compensatory, or remedial. Such programs, with usual emphasis on English, mathematics, and reading skills, are found in every Colorado institution of higher learning; and El Paso Community College, accepting the open door commitment, has chosen to substantially invest in its Skills Studies program of remedial-compensatory instruction, thereby assuring the new majority its maximum opportunity for lifelong learning.

Purpose

The primary purpose of this study was to ask,"Is EPCC's program of

remedial-compensatory education truly needed and effective?" Although the faculty and student body believe the program is effective and is needed, this study approaches the question from a less biased and more objective dimension. More specifically, the purpose was to determine the validity and reliability of those EPCC tests through which students are placed in classes and to determine, if any, those differences in achievement between students who receive remedial-compensatory courses before enrolling in other classes and those who go directly into transfer and career courses. A final endeavor was to determine the relationship of success in remedial-compensatory or 100-level courses with certain demographic variables. The methods used to realize these purposes are presented in Chapters V and VI.

Definitions

Throughout this report, the term "remedial-compensatory" is used interchangeably to mean and include basic, developmental, or skills studies. According to the Texas Senate Interim Report (Bernal, 1973), "'Remedial' [to include the terms 'basic' and 'skills studies'] implies the remediation of student deficiencies so that a student may enter a program for which he was previously ineligible...; whereas 'developmental' should refer to the development of skills or attitudes and may not be directly related to making a student eligible for another program" (p. ix). The term "compensatory" means "to make up for or counterbalance" (The American Heritage Dictionary, 1970). When the terms "remedial-compensatory" are combined, they produce an educational concept meaning "to offset deficiencies."

Based on this understanding of remedial-compensatory education, a more reasonable definition, and one which CCHE's Budget Advisory Committee and the Joint Budget Committee might consider using for purposes of planning, would be:

Remedial-compensatory instruction constitutes those comprehensive instructional programs offered for credit and designed to offset, alleviate, or minimize academic deficiencies in English, mathematics, and reading which prevent students' access to transfer or career programs.

Also, for purposes of this study, the expressions "selection test/score" and "placement test/score" are presumed to be synonomous.

Having examined the scope, function, and definition of remedial-compensatory education, and having stated the purpose of this study, we next examine the content of the EPCC Skills Studies program, followed by a summary of model program characteristics as identified by authorities in the field.

CHAPTER III

A REMEDIAL-COMPENSATORY PROGRAM

EPCC's Skills Program

The Skills Studies Department as a comprehensive, remedial-compensatory instructional program operates under a student-centered premise that there is no one instructional mode that works best for all persons. To this end, every available approach is utilized, from classroom teaching to individualized programmed instruction, to one-to-one tutorials. The primary emphasis is placed on classroom instruction with opportunities for student interaction since it is the most efficient, economical method available. Instruction in this setting is individualized to every extent possible.

Student entry into Skills courses is made through placement tests. Upon admission to EPCC, every student is administered diagnostic tests in reading, mathematics, and English unless waived because of educational achievement. The mathematics and English tests are in-house products; the Diagnostic Reading Test is a product of Science Research Associates. The parts of each test are keyed to specific levels of Skills courses so that course placement in Skills is determined by the level of achievement in these tests. The rationale for using these placement tests as a guidance procedure is obvious to most EPCC faculty.

Students enrolling during 74-75 had an average age of 32 and came to EPCC with widely varying backgrounds. They were expected to achieve certain levels of proficiency in the basic areas of English, mathematics, and/or reading as prerequisites to certain programs or courses. In most instances, students were able to enroll in Skills courses and in their selected programs simultaneously. Several course levels are available in each

Skills area. The student can thus begin at his current level of development and attain basic skills for entry into occupational or general studies courses.

In occupational programs, the level of proficiency is related to those basic reading, mathematics, or English skills needed to enroll in a specific program or for adequate job performance. For example, students in electronics must have mastered basic arithmetic and algebra concepts as prerequisites to college level technical mathematics. A solid understanding of mathematics is an unquestioned prerequisite to success in this field. In the case of secretarial students, or those in the food management programs, adequate skill in performing simple arithmetic operations is expected for satisfactory job performance. It is also understood that mastery of basic English and reading skills is also necessary as prerequisites to program entry and/or satisfactory job performance for these and other programs.

The college transfer student is also expected to reach levels of proficiency in mathematics, reading, and English adequate for successful work in the General Studies programs. The Skills Program at EPCC has enabled students from educationally disadvantaged backgrounds to pursue lower division college courses and then transfer to four year institutions and perform successfully at the upper division level.

The listing below shows the relationship between test/grade level and course assignment along with the percent of students in each category for the period from July 1, 1974, through June 30, 1975; more than 4700 students took the placement tests during this period.

SUMMARY OF PLACEMENT TEST RESULTS

From July 1, 1974, Through June 30, 1975

Course	Total	Percent	Entry Grade Level	Comment
ENGLISH	(N)			
English 010*	61	1.3	K-5	This course level develops basic vocabulary, knowledge of the relationship of words, and an understanding of some fundamental rules of English usage.
English 020	992	21.0	6-9	This course level develops the ability to write sentences and simpler paragraphs.
English 030	205	4.3	6-12	This is a basic course in spelling.
English 050	2030	43.0	10-12	This course, a continuation of Enl 020, helps students with paragraph and theme development.
OK for Freshman English	1436 4724	30.4 100%		Students testing at this level are prepared to enter college transfer courses in English Composition.
READING				
Reading 010	265	5.9	K-6	In this course, students are taught phonics, the basic sounds of the language. They use this skill to recognize and pronounce words encountered in the reading process. This course also supplements Enl 030 (Spelling) and students for whom English is a second language.

*These courses will be abbreviated throughout this study as follows: English = Enl; Reading = Rea; Mathematics = Mat.

Course	Total	Percent	Entry Grade Level	Comment
Reading 020	1731	38.2	7-9	This course develops basic silent reading skills. Comprehension, vocabulary, and speed are emphasized in this order.
Reading 050	1564	34.5	10-12	This course brings the student to a level of competence in reading that is adequate for adult performance. It may be noted that 79% of EPCC students tested in the time period were at or below this level.
Reading 101	971 / 4531	21.4% / 100%	13	This course emphasizes advanced techniques of reading and study skills as applied to materials used in college-level courses.
MATHEMATICS				
Math 010	2392	51.2	K-8	This course develops basic arithmetic skills in addition, subtraction, multiplication, and division of whole numbers, decimals, fractions,and percentage. It may be noted that 51% of those tested placed at this level.
Math 020	1860	39.8	9-10	This course develops a knowledge of basic concepts of elementary algebra.
Math 030	334	7.1	11-12	This course completes the work of elementary algebra. Students testing to this level may enter Mat 151 Technical Mathematics, which is required in such programs as Architectural and Construction Technology, Drafting, and Mechanical Technology.
Math 100	72	1.5	13	The Mat 100 course is intermediate algebra and is taught in the Mathematics and Science Department.

Course	Total	Percent	Entry Grade Level	Comment
Math 111	16	0.3	13	This level of mathematics is the beginning of a two-year college transfer sequence in mathematics designed for majors in mathematics, physical science, and engineering.
	4674	100%		

The placement test program at EPCC reveals that most students entering EPCC require some compensatory or refresher work in English, mathematics, and reading before or while taking courses in the program of their choice. For example, whereas 43% of those taking the English test required some work in paragraph and theme development--skills usually mastered in grades 10-12--21% needed Skills English to help them write basic sentences, and 1.3% (N=61) needed help usually offered to students in grades K-5. Similar patterns are evident for reading and mathematics. Most students taking the Mathematics Placement Test Battery need the basic arithmetic course (Mat 010), material usually covered in grades 0-8. Less than 2% of all entering students are prepared to enroll in college-level engineering mathematics. Concerning reading achievement, approximately one-third (38.2%) of the entering students have a 6-8th grade reading level. Since most college textbooks have a vocabulary level and sentence structure requiring an 11-13th grade reading achievement ability, the majority of entering EPCC students need one or more reading courses in order to successfully pursue college-level courses. Only 21% of those entering have the reading achievement necessary to handle college texts successfully.

It should be readily apparent that EPCC's placement tests must be valid and reliable instruments. Their use as counseling-advising tools for all students requires that they be accurate measures of student achievement.

Testing the validity and reliability of these instruments was a function of the pilot study, the results of which are found in Chapter V.

Once the student has taken the diagnostic battery, EPCC's Counseling Office uses the test results to place the student in courses commensurate with his level of achievement. Although it has often been thought optional to place seriously disadvantaged students only in Skills classes, budgetary limitations and the resulting limited number of class sections have usually prevented this assignment. Students are often forced to take courses for which they lack the prerequisite skills. Some succeed in these college level courses out of pure determination; others struggle and often drop out. The withdrawal (W) or unsatisfactory (U) grade on a transcript is usually a silent reminder that insufficient opportunities are available for low achieving, high-risk students.

Nevertheless, for students enrolled in Skills Courses, our limited evidence reveals that students gain confidence and improve their skills sufficiently to enroll and succeed in sequence courses for transfer and career programs.

Once the student is enrolled in one or more Skills Courses, he is free to remain in class and/or work on his own in the Skills Lab, using alternative texts, programmed materials, or tutorial assistance. Credit is given for coursework, and a maximum of twelve elective hours may be applied to the A.A. or A.S. degree. Grades of A, B, or C are awarded as passing grades; students who receive C grades for Skills Courses are often encouraged to repeat those courses. An unsatisfactory grade (U) is given to students who withdraw late in the quarter or who did not meet course objectives. In addition, grading standards are fairly rigid. Grades of A, B, and C are

awarded only to students who have met required behavioral objectives. Experience has shown that students not meeting curriculum standards are usually not successful in sequence courses offered in transfer and career programs.

All twelve Skills Course outlines (four each in English, mathematics, and reading) were written using behavioral objectives. Instruction, testing, and grading are designed to integrate these objectives. Although this is especially true for testing and grading, instructional style is so personal that method is never dictated. Skills instructors are well informed about course objectives and are urged to use a teaching style and method with which they and their students feel comfortable. Through periodic student and administrative evaluations, instructor effectiveness is determined both in terms of teaching style and ability to assist students in achieving course objectives. Based on the repeated high evaluations received by Skills' instructors, it is reasonable to conclude that this staff is successful in helping students learn.

Instruction is individualized and personalized to every possible extent. During the first years of the Skills Program (1969-71), students spent an equal amount of time in class and in lab working on individualized course packages. The staff found that students resented a compulsory lab experience, and in several instances teachers actually sabotaged the forced methodology in preference to their own approach. In 1971, Dwain Thatcher, then a doctoral candidate at Brigham Young University, chose for his dissertation to study the effectiveness of three different teaching approaches used by Skills teachers (Thatcher, 1972). A spin-off from the study revealed that teacher commitment or lack of same had a direct bearing on the

effectiveness of any teaching approach. What this said to the Skills faculty was, "Use a teaching approach to which you feel committed; and if both you and your students feel comfortable with it, the chances are excellent your students will achieve the course objectives." This philosophy of teaching style is still in force, and from all observations, it appeals to students and teachers alike.

Initial efforts with individualized instruction, in its purest form, taught us that some students resented this approach. Local studies revealed that students with underprepared backgrounds preferred the traditional classroom approach and the socialization it offers. Today's Skills Program reflects that traditional model and at the same time offers a multiplicity of instructional approaches to those desiring them. Every attempt is made to personalize instruction within the group setting, and considerable attempt is made to personalize the approach to students. Again the EPCC experience reveals that the interpersonal relationship between student and teacher is as much an important element in helping students learn as is the curriculum and approaches to instruction.

The Skills approach to instruction allows for contact with large numbers of students, hence reducing program cost. The subject of program cost is discussed in another section of this study. During 1974-76, the program had over 6,000 course enrollments with approximately 60 course sections each quarter in English, mathematics, and reading, and a student-faculty ratio of 27:1. This ratio is considerably higher than desired, and there are indications that teacher effectiveness and student achievement were markedly affected. At the same time of this writing (fall '75), Skills had more than 1,000 enrollments and a student-faculty ratio of 21:1. This ratio is reasonable, and it is expected that teacher effectiveness and student academic achievement will be greatly improved over the previous year.

Structurally, the Skills Program is a department within the General Studies Division which serves all its programs and those in the Occupational Studies Division. The Department is administered by a chairman and

staffed during 75-76 with 21.3 FTE faculty, of which eleven are full-time classroom teachers and two are full-time tutors; the remainder are part-time faculty. This instructional staff, some with bachelor degrees and doctorates, but most with master's, have teaching experience at all educational levels, with each faculty member averaging fifteen years of classroom instruction.

The Department and its staff are equipped to work with virtually any student classified as educable. The average student age is 32; for many this is their first post-secondary experience. About 30% of the students in Skills courses come from minority, disadvantaged backgrounds, and about 5% of the Skills population are court, hospital, and social welfare referrals. Educational backgrounds range from functional illiterates with less than a 4th grade education, to college graduates who wish to improve their reading speed and comprehension, to secretaries with business college diplomas who take the phonics course to improve their pronunciation, spelling, and dictation.

The reasons given by students for taking Skills courses are legion; a most concise synopsis is found in the 76-77 budget narrative for Skills Studies (Traylor, 1975):

> - The average age is over 30, and many are attempting education beyond the high school for the first time. Those critics who complain that persons beyond high school age should already have these basic skills are correct, but for whatever reasons, the facts are that many do not, and at this adult age they are not about to return to a high school setting. "College," at whatever level, is an acceptable image for these persons.
>
> - Job competency and advancement many times depend on a basic ability to communicate ideas and facts in effective ways demanded by the position. This may vary from a policeman's written report, to a technician's briefing of management, to a shop mechanic's estimate of a repair job. All occupational programs at EPCC require a minimum skills level for entry; college transfer study also sets minimum standards.

- Experience for six years at EPCC with thousands of students has demonstrated to our satisfaction that students who have gained basic knowledge and much self-confidence through the learning skills classes progress faster and achieve higher levels of trade-technical ability than would have been possible had they struggled along without the basic learning tools.

- Currently, veterans comprise about 60% of the learning skills enrollment, indicating that many GI's are using EPCC as a "second chance" opportunity for an education. For some, it may be the final chance.

Whatever the reasons, students continue to enroll in the Skills Program. There, they find caring teachers who are experts in their fields; they also find an efficient, comprehensive approach to instruction where students are the center of concern.

Consistent with the belief that the Skills Program of remedial-compensatory education has been effective in terms of student achievement, the staff, on occasion, conducted related studies, especially ones demonstrating the effectiveness of EPCC's placement tests as diagnostic and prescriptive instruments. The following is a chronology of these inhouse studies.

1970-72

Several studies were conducted during the 1970-71 and 1971-72 academic year in response to uncertainties about the effectiveness of EPCC's diagnostic test battery and the resulting effectiveness of placement in the Skills program. This two year period produced considerable controversy over the need for a Skills program, the accurate scoring of placement tests,the accurate assignment of students to remedial or college level courses, and the value of the Skills curriculum as a means of preparing students for college level courses.

During the fall quarter ('71-'72), EPCC President, Robert O. Hatton, created a widely representative committee,charging it with the responsi-

bility of conducting research relative to the effectiveness of the diagnostic, placement, and remedial programs. This study, completed in March, 1972, produced variable results and was met with such criticism over the research methodology that the committee decided to hire EPCC psychology instructor, Ken Carter, to replicate the study using more sophisticated research techniques.

That same month, Carter (1972) conducted his study to determine if there was any significant difference in academic success as determined by total grade point average (GPA) among: (A) students who took the placement tests and enrolled in courses as indicated by the test scores; (B) students who took the placement exams and, according to their test scores, were misplaced in courses; and (C) students who did not take the placement tests and enrolled in courses without the guide lines of having test scores.

These hypotheses were tested:

1. There is no significant difference in total GPA between Groups A and C.
2. There is no significant difference in total GPA between Groups A and B.
3. There is no significant difference in total GPA between Groups B and C.

The first hypothesis was accepted. Carter noted, "There was no significant difference in academic success between tested and correctly placed subjects and non-tested subjects."

The second hypothesis produced variable results. "When grades are computed using only A, B, and C grades, the subjects who were tested and properly placed performed significantly better than subjects who were tested and misplaced. However, if the N grade* is added as representing

*No Credit: Course audited, minimum objectives not met, or withdrew from course. (1971-72 EPCC Catalog)

failure, then there is no significant difference between the two groups."

The results for the third hypothesis were the same as those for the second.

Although recognizing the limitation of the study, Carter admits significant differences among misplaced, non-tested, and tested students, but only where academic success is defined using A, B, and C grades.

Based on the results of this study, Carter took a cautious stand and recommended "Until further research is accomplished in the area of placement testing at El Paso Community College, it would be premature and possibly unjust, especially if misplaced because of a placement exam score, to deny students the opportunity to take courses unless specified by the present testing program."

With considerable administrative effort and departmental cooperation, the problems of misplacing students was rapidly solved. The Skills Staff then went on to further test the effectiveness of its program. Although the original documents are not available, summaries of these studies are found in several college publications.

Fall, 1972-73

A random sample of 100 students was selected from those who took EPCC's placement test battery before fall admission. Of the 100, 22 potential students did not enroll. Of those who enrolled, 69% were in occupational programs, and 31% were in college transfer programs.

The students needing Skills courses were divided into two groups: Group A needed Skills courses but did not take them; Group B students needed and took these courses.

By the end of spring quarter, Group A showed a 73% failure rate in Freshman English (Enl 101) and an 80% failure rate in Freshman Mathematics

(Mat 101); Group B students showed a 29% rate of failure in Enl 101 and a 20% failure rate in Mat 101.

Another related study was made of students enrolled in college transfer Mat 101. Sixty-seven percent of the students enrolled in this course who needed Skills dropped Mat 101 before the course ended. On the other hand, only 10% of the students who tested as ready to enroll in Mat 101 dropped the course.

The need for a good diagnostic, placement, and prescriptive program was evident even in those early years of the college. The remaining four studies, conducted by EPCC staff, continued to analyze various components of that program.

Spring 1972-73

Miller (1973) conducted a study to determine whether the Stanford Achievement High School English Test (SAHSET) or EPCC's English Placement Test (a writing sample) was a more effective placement tool. He concluded, "There seems to be little correlation between recognition of mechanical errors in someone else's writing and avoidance of mechanical errors in a student's own writing." Although he had assumed that low-scoring students on the SAHSET would place students in low level Skills classes as determined by the writing sample, the data analysis disproved this assumption. Miller did, however, find that high-level achievers on the SAHSET were likewise high-level achievers on the writing sample.

Spring 1972-73

Concerned with a 21% attrition, Rodwick (1972) conducted a follow-up of students who withdrew from Skills courses during the winter quarter. A questionnaire was mailed to 159 students requesting that they check the reason(s) why they dropped or never attended the Skills course(s). There

was a 48% response. The majority listed illness, finances, job requirements, and insufficient time as the prime reasons for dropping or withdrawing. Other explanations included,in descending order of importance: inappropriate classtime, withdrawal from school, time conflict with job or other classes, transportation problems, course was too difficult or too easy, course was not what was anticipated, instructor's presentation was inadequate, and personal objective for taking the course had been met. When asked if they would reenroll for the same class during some subsequent quarter, 56% said yes, 10% no, 1% uncertain, and 33% no reply. Rodwick concluded that although some students who withdrew were dissatisfied with the instructor or instruction--variables over which the Skills staff had control--the majority of students withdrew for reasons over which the college had no control.

Fall 1974-75

Le Beau (1974) studied the results of 1,612 EPCC freshmen who took the SRA Diagnostic Reading Test (DRT) during August and September, 1974, and compared the results with the DRT national norms. Le Beau found that the mean scores for the men in this sample fell at the 34th percentile for reading rate, the 16th percentile for vocabulary, and the 14th percentile for total score. The mean scores for women fell at the 47th percentile for reading rate, the 21st percentile for vocabulary, and the 17th percentile for total score.

As a group, these EPCC students scored at the 39th percentile for reading rate, the 19th percentile for vocabulary, and the 14th percentile for the total score. Although no attempt was made to determine sample representation, if it is assumed that the sample was generally representative of EPCC's student body, it can be tentatively concluded that 86% of all

freshman men and women nationally taking this test are better readers than EPCC entering students. The need for the Skills reading program seems apparent.

Fall, 1975-76

In his study to determine concurrent validity, Stattman (1975) administered both the EPCC diagnostic battery and the newly developed Skills Quick Test (SQT) to 100 military personnel enrolled in Fort Carson's Skills Studies program. The object of the 15 minute SQT was to determine generally and quickly whether a potential student had a need for a Skills course in English, mathematics, or reading as a prerequisite to transfer or career programs. The results of the study showed that the SQT does correlate with the EPCC diagnostic battery as a general discriminator of those who need Skills courses and those who don't. Once enrolled in the Fort Carson's Skills program, the student is given the EPCC diagnostic battery to determine specific achievement levels and needed course placement.

These studies, conducted over the last four years, demonstrate an effort on the part of the Skills staff and other EPCC professionals to assure themselves of the usefulness of EPCC's placement tools and the effectiveness of its remedial-compensatory program.

Because of their willingness to explore questions relative to the Skills Program and make appropriate changes, the staff has developed a program which is seen as a model by many in Colorado and elsewhere. As part of this study, we identified characteristics of model programs as perceived by recognized professionals in the field of compensatory education. This effort was designed to determine if EPCC's Skills Studies Program was substantially different from other models.

Characteristics of Model Programs

The community college in its exemplary or comprehensive form is an open-admission institution characterized by diverse curricular offerings in academic transfer and technical-vocational areas, with a heavy emphasis on remedial-compensatory and continuing education (Morrison, 1973; Morrison et al, 1975). As a model definition of the two-year college, Morrison included remedial-compensatory programs within the scope and services of the community college. As models exist for colleges in general, models are equally appropriate for specific college programs. A relatively newcomer to the community college, there appear to be few discussions of what constitutes a model for remedial-compensatory programs; however, of those few existing reports, there seems to be consensus regarding general program components. The following synthesis represents the major components of a comprehensive remedial-compensatory program as viewed by Kirk (1972):

1. Location in a separate division with its own staff. This characteristic is also stressed by Roueche and Kirk (1975), Marchbanks (1974), and Engdahl (1975).
2. Volunteer and willing full/part time instructors.
3. Counselors capable of working with the disadvantaged.
4. Race-ethnic composition of staff approximating that of students in the program.
5. A two semester program.
6. A program consisting of "basic tool" subjects, (mathematics, English, reading, and writing. In his report, Swofford (1973) found that for all the remedial-compensatory programs in North Carolina and Virginia community colleges, the emphasis was on elementary

and secondary level English, mathematics, and reading. Franklin (1974) adds to this program the need for helping each student to increase self-confidence in his ability to develop proficiency in reading and interpreting new materials, writing, and oral expression so that these newly learned skills will contribute to his success in other college subjects. Franklin also suggested that instructors help each student develop the ability to transfer the basic skills learned to other subject areas.

7. All courses credited for graduation. This point is stressed by Cross (1971) and Roueche and Kirk (1973) who suggest that "all developmental courses should carry credit for graduation or program certification" (p. 87). Although Rufus (1970) agrees with this position, he believes that credit should be based on the amount and quality of work as outlined in the behavioral objectives of the course rather than time spent. The recommendation of the Texas Senate Interim Committee (Bernal, 1973) on remedial-compensatory education is, "If grading standards are equally as rigorous for remedial programs as for the regular program, the institution should give credit toward graduation" (p. 17). Moore (1971) concluded this argument by contending that full credit for developmental courses would help these programs become a more integral part of the community college curricula. Finally, in the Divirian, et al (1975) survey of college reading and study skills programs, the authors found that 63% of those institutions surveyed offered college credit for reading classes.

8. Provisions for reduced course load.

9. Non-Punitive grades. Roueche and Kirk (1973) elaborated on this suggestion by stating that this practice does not imply a lowering of standards. They contended that students should not be awarded credit until the course requirement was met. Such a practice, they felt, eliminated the need for an F grade.
10. Counseling for realistic career choices.
11. Minimizing transitional stress from remedial to regular programs.

The Texas Senate Interim Committee (Bernal, 1973) added to this list the "recognition of and respect for cultural differences, where they exist" (p. 16).

Franklin (1974) suggested two additional areas: (1) courses to develop positive attitudes regarding learning, self-responsibility, inner motivation, and discipline that will serve as reinforcements for success in college level work; and (2) courses to help students develop the study and research techniques necessary for success with college level work. Ross (1972) would probably add to this compendium another touch. In her work with freshmen at Tarrant County Junior College (Texas), she found that second semester tutors working with first semester reading students enhanced the learning opportunities for both the tutors and students. It seems that a strong tutor-student program would be an appropriate addition to the remedial-compensatory program model.

A final cap to this model is suggested by Bossone (1966). The author, citing supportive research, contends that an instructor should not be required to teach more than two non-traditional students per class. Marchbanks concluded that "the rationale for these recommendations was based on the evidence that non-traditional students required more individual assistance in teacher contact time. Moreover, more teacher time was

required for the development of individualized, instructional material" (p. 13).

Based on the description of the Skills Studies Program and a summary of model program characteristics, it is reasonable to conclude that EPCC's remedial-compensatory program, in general, attempts to satisfy the model requirements as suggested by authorities in the field. Consistent with EPCC's attempt to provide a quality model program of remedial compensatory education, this study represents only one of several attempts to examine and improve that program.

CHAPTER IV

REVIEW OF LITERATURE

Related Research: Need for Remedial - Compensatory Programs

Without question, the community college open door policy has created an influx of a "new majority" (Hechinger, 1975) with students requiring programs designed to meet their needs. This student influx has been entering the open door for the past several decades, but never in such numbers as discussed earlier or with such diverse backgrounds as we see today. A decade ago, Blocker, Plummer, and Richardson (1965) found: "....that the public two-year college -- whether it be a branch, a technical institute, or a public community college -- has a responsibility to provide developmental curricula for individuals with some potential for education beyond high school. These individuals should have an opportunity to demonstrate their ability to grow intellectually to the limits of their innate capacities and motivations" (p. 1). The authors suggest that remedial-compensatory courses in basic language and mathematics skills be provided since these areas are prerequisite to further study in all transfer or career programs.

The open-door brings to the community college its share of problems. Kaplan (1972), equally aware of this phenomenon believed, "It's a whole new ball game" for community colleges:

> In the past, colleges became used to dealing with students who had at least an adequate high school background, and, at least, partially-developed academic skills. As a result they were able to focus on teaching content and play down or even ignore the problem of skill development. But open-admissions has brought with it an entirely new set of problems relating to skill development (p. 214).

A decade later, the need for such programs is still evident. In their most recent study, Devirian, Enright, and Smith (1975) surveyed 3,389 cam-

puses of 2,783 post secondary institutions and investigated the nature and extent of college reading and study skills programs. With a return rate of 1,258 responses (38%), the authors found that nearly 50% of the respondents felt that the open door policy was the main reason for having established a remedial-compensatory program. An equal number also indicated that they had a comprehensive program which included career planning, mathematics, reading, and writing.

The need for remedial-compensatory programs in our community colleges seems to be greater than ever. Scheer (1975) states, "If you have a truly OPEN DOOR...the instructor must look for ways to make it possible for... students to make up deficiencies, review and be successful" (p. 1). Marchbanks (1974) was equally vocal when she said, "Unless the community college has established special programs to assist high-risk students who lack adequate preparation, these students will be in the open-door and out the revolving door in but a brief time span" (p. 4). Her position is echoed by Fascett and Cambell (1970) who stated:

> What does it profit an individual if the school is near enough to make attendance feasible and open enough to permit him to enter, if, once in, he is not helped in those many non-functional areas where help is necessary to promote his development (p. 180)?

Many colleges are responding to this "call to action," having recognized the need to provide remedial-compensatory programs for their "new majority." Perhaps the most outstanding progress has been found among several community junior colleges in Texas. There, the high-risk student is being given the desperately needed second chance. The reflection of commitment and the pressing need for such programs to serve the disadvantaged, high-risk student is well stated in the Report of the Texas Senate Interim Committee on Public Junior Colleges (Bernal, 1973):

> The open door philosophy which underlies our community junior colleges charges those institutions with the responsibility of providing opportunities for post-secondary education to the citizens of Texas. Their role has been greatly expanded in recent years because of their assumption of increased responsibility for the education of so-called "disadvantaged" youths; that is, those who come to the colleges with educationally, economically, socially, or culturally deprived backgrounds. These non-traditional or "high-risk" students have entered the state's junior colleges in ever increasing numbers in recent years, and they pose a challenge to the colleges to live up to their democratic promise to provide educational opportunity for all. The four-year institutions, by and large, are doing little to encourage or aid disadvantaged students, leaving it to the junior colleges to fulfill society's role.
>
> . . . . . .
>
> The role is there, then, for the community junior colleges to serve the needs of disadvantaged youth. It has been virtually forced on them and they have accepted it (ix).

It is encouraging to find this commitment and to know that Texas community-junior college students are well on their way to having that second chance.

There are many other students for whom this chance is only a dream. Studies showing the basic need for remedial-compensatory programs are so shocking one wonders how a great many Americans survive in this highly technical, sophisticated age.

On November 1, 1975, the U.S. Office of Education released the results of a four year, $1-million project (Northcutt, 1975) conducted by the University of Texas at Austin which indicated that more than 23 million U.S. adults are functionally illiterate, meaning that they are unable to do such things as read help wanted ads or make the most economical purchases. "It is surprising, perhaps even shocking," the report said, "to suggest that approximately one of five Americans is incompetent or functions with difficulty and that about half of the adult population is merely functional and not at all proficient in necessary skills and knowledge."

Combining the writing, mathematics, and reading skills in nine areas measured through tests and interviews with thousands of adults, the researchers said that 19.7% scored in the low range, 33.9% in the medium range, and 46.3% in the high or proficient range. The study found that the functionally incompetent were likely to be older, undereducated, unskilled--perhaps unemployed--and living in poverty. Sixteen per cent of the white population was in the lowest category, compared with 44% blacks and 56% of Spanish-surnamed persons.

On a state level, Calvin M. Frazier, Colorado Commissioner of Education, recently noted that there are over 225,000 Colorado adults who are functionally illiterate; he believes that one of the goals of community education programs should be to reduce adult illiteracy. Dr. Frazier proposes that we begin "offering a K-12 educational opportunity to everyone at anytime during his lifetime" (Gazette Telegraph, 1975). In another publication (Grady, 1975), Frazier notes that "The most recent census showed that over 460,000 Colorado citizens could benefit from adult basic education programs." And the people of Colorado are themselves asking for and willing to participate in such programs. This fact was just uncovered in the October, 1975, Colorado Adult Needs Assessment study in which Barlow and Timiraos (1975) concluded that,"The people of Colorado recognize and appreciate adult learning as a necessary and desirable means toward improving their lives. Their view toward education is serious and mature."

Jane Larsh operates Colorado's Right-to-Read endeavor, a program in Frazier's department. According to Branscombe (1975), Larsh claims that in 1973 national Right-to-Read officials met with U.S. Office of Education personnel and developed a definition of literacy wider in scope than the traditional concept:

> A literate person is one who has acquired the essential knowledge and skills in reading, writing and computation required for effective functioning in society and whose attainment in such skills makes it possible for him to develop new aptitudes and to participate actively in the life of his times (p. 20).

This definition is similar to Northcutt's concept. Branscombe concludes, "If that's got to be the name of the literacy, the education process has a long way to go to get into it."

As the nation suffers from illiteracy, the community college seems to have extended a welcome hand by offering remedial-compensatory education for those who can benefit. But interestingly enough, it isn't the illiterate poor, jobless, and undereducated who alone are suffering. Apparently, many recent high school graduates, and indeed even regular college students, are finding their basic skills wanting. Woestendick (1975) reports that according to a New York Times survey, "Publishers, responding to a changing market in college texts, are increasingly resorting to simplified language in their books to adjust to a new element in higher education--the college student who cannot read at traditional college levels" (p. 1). Woestendick is highly critical of today's college students who are unable to read the English language well enough to understand the college texts used by students of previous generations. However, he believes that the saddest commentary is that few colleges are responsive to their students' language needs, and he thinks that it is a "cop-out" when colleges insist that authors must rewrite their texts to meet the language standards of most college students.

In that same article, Royer, former editor of The Wall Street Journal, is cited as giving several examples of a new trend showing that many college students are not adequately prepared to handle college language skills. Here are those examples:

At the University of Wisconsin more than one-third of the applicants to its journalism school cannot meet the minimum requirements in spelling, grammar, word usage, and punctuation.

At the University of North Carolina, ... the journalism school has been forced to require all students to pass a simple, high school level spelling and usage test in order to graduate ... 47% failed (and even after a second try) there were still 39% who had not passed.

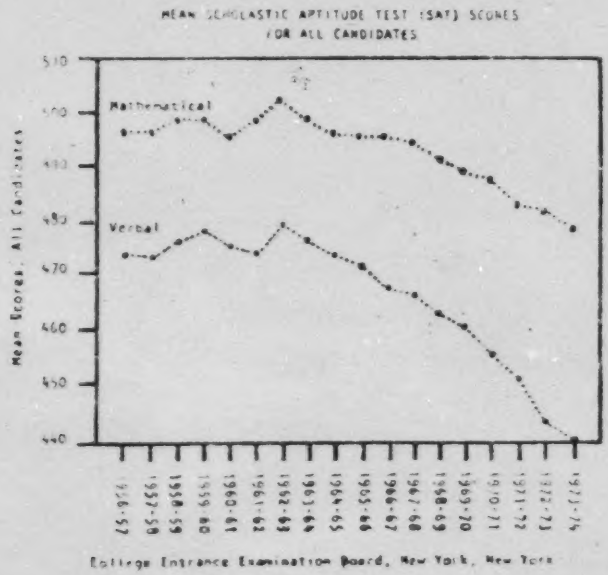
At East Michigan University, the number of students in all departments having to take remedial English has doubled in the past five years.

At the University of California, 45% of the total student body needed remedial English.

Community colleges are not exempt from these statistics either. The most recent estimate of achievement for community college military students at Fort Carson is given by Roades and Stattman (1975). The El Paso Community College diagnostic placement test battery was administered to 96 military students enrolled in EPCC's Ft. Carson program. Of those tested, 76% fell below college level reading ability, 35% were unable to do basic arithmetic, 95% lacked proficiency in high school algebra, and 72% required some remedial English work. Roades and Stattman concluded, "Of the ninety-six students tested, ninety-one, or 95% require one or more Skills courses to attain proficiency (p. 4)." Janssen (1975) reports similar findings in his study of Indian students at Navajo Community College in Arizona.

Functional illiteracy, university remedial courses, and low achieving community college students seem to be a national trend--a trend which is becoming increasingly embarrassing to a nation which in 1974 spent $96.3 billion for all types of education--even more than for national defense. That startling figure comes from a recent study on primary and secondary education by Armbruster (1975) published by the Hudson Institute.

Armbruster's major findings bear out what conservatives have been saying all along: despite the astronomical sums spent on education, achievement in both verbal and mathematical skills have been declining. Moreover, these skills have been declining most dramatically among the brightest groups of children. For example, students taking the College Entrance Examination Board's, Scholastic Aptitude Test (SAT) are scoring lower than ever before; there's been a consistent drop in mean SAT scores over the past 17 years. This point is dramatically illustrated in the graph below (Armbruster, 1975).



In Texas, the Senate Interim Committee (Bernal, 1975) found the same trend. Using the American College Test (ACT) composite scores for Texas High School Seniors for 1967 and 1971, the Committee found that the Class of '67 scored significantly higher on the ACT than the graduating class four years later. A follow-up survey of Junior College Freshmen for fall 71-72 revealed a similar decline in ability or achievement levels of students

entering Texas two-year colleges over previous years.

In Colorado, this trend is no different as seen by two university administrators.

Denver University Chancellor, Maurice Mitchell, aware that national test scores have been dropping for twelve years, is especially appalled at the noticeable declining competance in reading, mathematics, and writing among college students. According to a Colorado Springs Sun press release (7/7/75), Mitchell believes that today's students may be more sophisticated than their parents but they certainly are more deficient in basic skills.

> I'm appalled by the general trend of nearly all college applicants who have enormous deficiencies. They are afraid of math and science. They write and speak in an informed manner which shows they have no real understanding of their language or anybody else's (p. 12).

In another Sun release (12/5/75), University of Colorado President Roland C. Rautenstraus gives his understanding of this trend. He believes that today's "student is better informed, more intelligent and possesses a better grip on reality than his counterparts of even a few years ago." However, he goes on to express concern about recent decline in achievement level of freshmen based on national scholastic aptitude testing programs.

"In his opinion," the Sun article continues, "the decline may measure a tradeoff, where students have traded off higher skills in language and math, which the tests measure, for higher skills in the social concerns, such as the politics of global geography. 'This is a valid tradeoff,'" quotes Rautenstraus. He concluded, however, that if the tradeoff is not the explanation for declining skills levels, ... "then secondary and higher education must get together to develop remedial programs in reading, writing, and math."

In summary, the need for remedial-compensatory programs in our community colleges becomes more obvious as we review current trends. Elementary

and secondary students are achieving less in basic learning skills than in previous years; the same thing is true for high school, community college, and university students. We have these choices: reduce our educational standards, rewrite our textbooks, or seek new educational models that work for today's new student. As Traylor (1975) states in his budget report for the Skills Studies Program at El Paso Community College:

> It would seem better to provide a means for persons to acquire necessary job skills, partially through a learning skills program, than to ignore the need and pay a far greater price in less productive citizens.

Indeed the choice is ours. Do we give these students a second chance or default on our responsibility as an open-door institution?

Related Research: Program Effectiveness

Assuming we choose to give these disadvantaged, high-risk students the remedial-compensatory programs that they need to succeed, how effective will they be, and how can funding agencies be assured their dollars are wisely spent? The literature shows that where there is a commitment to remedial-compensatory education at both community college and university levels, there is student satisfaction and reasonable academic achievement.

Morrison (1974) undertook a study to evaluate the State University College at Oswego's special program to determine the degree to which the program enhanced the academic success of educationally-disadvantaged students. Although the data suggest that these students earned lower cumulative grade point averages, more failing grades, and credits at a slower rate than regularly admitted students, the results indicated that a program of supportive services tended to enhance the academic achievement of persistent high-risk students. The study supports the argument that the chances for success for educationally-disadvantaged students are greatly increased when they are placed in a program designed to meet their academic, financial, cultural, and social needs.

Creighton (1970) looked at the successful retention of high-risk students from another dimension by studying the effectiveness of traditional admissions methods such as college entrance exams. He found that for the educationally disadvantaged student, peer prediction was the best indicator of success. High school counselors achieved the dubious distinction of having the poorest "track record" in estimating the academic performance of these students. The study results also suggested that the more hours disadvantaged students attempted, the higher their achieved GPA. This finding tends to refute the assumption that disadvantaged students perform better academically when they carry reduced class loads.

Hence, chances for student success in remedial-compensatory programs are enhanced not only when program designs meet student needs but also when traditional predictors and course load requirement are replaced with more relevant models. The end result of these efforts as viewed by Rouche and Kirk (1973) was that: "Students in remedial programs earned significantly higher grades than did high-risk students in non-remedial programs, [and that] ... students in remedial programs persisted in college to a greater extent than did high-risk students in non-remedial programs."

Given the chance and the program, the persistent student will succeed in and benefit from his educational experience.

Other studies demonstrate the effect of compensatory programs in English, mathematics, and reading. Troyka (1973) and others researched several topics in the area of remedial English studies.

Troyka (1973) studied the effect of simulation-gaming on expository prose competence of community college remedial English composition students. The results supported the contention that simulation-gaming has a positive effect on the writing abilities of disadvantaged students. Hamilton and

Heinkel (1967) used programmed materials at San Diego City College and found that remedial English students using this instructional approach scored significantly higher on final exams than those who had regular instruction.

Black (1974) of Richland College revealed another successful approach. Her study was designed to determine whether participation in the college's Developmental Writing Laboratory would result in a significant improvement of student's grades in freshman composition (English 101) and a significant decrease in English 101 dropouts. Black found that writing lab participants had greater success and a lower dropout rate in freshman English than those in the control group. A follow up study by Grizzle (1975) confirmed Black's report. Grizzle concluded that "if the assumption is made that a purpose of Developmental Writing is to prepare students in composition skills for the academic requirements of Freshman English, then Richland's program has been successful" (p. 4).

Developmental mathematics studies by Bragg (1973), Berger(1971), and Scheer (1975 a; b) all reveal efforts to better understand the effects of their programs. Bragg (1973) found that students who scored low on placement tests also performed unsatisfactorily in freshman level courses even after completing remedial studies. He suggested that students' unsatisfactory work may have been caused by instructors who allowed lower passing standards for remedial students.

Berger (1971) studies the results of the remedial mathematics program at City College of New York after its first year as an open-door institution. He found that of those freshmen who took a remedial mathematics course, 60% later passed Math-1, Beginning Calculus; a control group of low ability students going directly into Math-1 had a pass-rate of 19%.

Scheer (1975,a) noted in a fall, 1974, study accomplished at Richland

College that students in Developmental Math received higher grades in freshman mathematics courses than students who didn't take the remedial-compensatory program. In a follow-up, Scheer (1975,b) compared former Developmental Mathematics students with others enrolled in a freshman mathematics series. She concluded that the former Developmental Mathematics students had sufficient skills to compete with other students not requiring remedial work. Although the percentage of A, B, and C grades were approximately equal for both groups, it appeared that the Developmental Mathematics program accomplished its purpose by bringing its students up to a level of competence and confidence necessary to compete with other regular students.

Lodewick (1975) compared the pre and post-test scores of Richland College reading students using SRA's Diagnostic Reading Test to determine gains in reading skills. The study, conducted during the spring and summer quarters, 1975, indicated that more than 60% of the students sampled made gains in one or more areas. Lodewick also attempted to determine whether coursework in Developmental Reading had a beneficial effect when former reading students enrolled in other courses. He found that coursework in reading for remedial students minimized the academic advantage held by non-remedial students. Students who needed and enrolled in Richland's Developmental Reading program were able to effectively compete with students not requiring remedial courses. Scheer's (1975) findings agreed with this conclusion.

These studies generate one revealing conclusion: students who need and take remedial-compensatory coursework have a better than average chance of succeeding in college-level courses and of competing confidently with peers not requiring remedial work. Perhaps this is all anyone can expect. Remedial-compensatory programs in themselves were never meant to produce Rhodes scholars. If these programs assist students in successfully competing in courses at the

college-level, then it must be concluded that the open-door is not a misrepresentation-- that it truly means an opportunity for that second chance.

Summary

An understanding of program needs and program effectiveness, a description of the EPCC program, a recognition of model program components, and some introductory comments on background and philosophy-- together constitute a gestalt for remedial-compensatory education. This three-chapter overview encapsulates the most important elements of "second-chance" programs, and it should serve as a guide for those who staff and those who fund the Skills Studies program at El Paso Community College.

An appropriate conclusion has been voiced by Engdahl (1975) who, in her evaluation of remedial-compensatory education in Colorado, aptly states:

> Remedial instruction is an essential component of the primary program thrust of the two-year colleges...Remedial instruction programs in Colorado institutions cannot be challenged as a misleading program which entice students to enroll only to provide no opportunity for success.
>
> . . . . . .
>
> The decision must be made as to whether the student is educationally disadvantaged, often a minority member and from the lower-socio-economic level, should have the opportunity for post-secondary education. If the decision is yes, the services to help him reach his educational goals must be provided (pp. 34-35).

Do we give them a "second chance?" Perhaps Traylor (1975) is correct when he says, "For some, it may be the final chance."

CHAPTER V

THE PRELIMINARY STUDY

Introduction

The overall study was designed to measure the reliability of the EPCC placement instruments (the pilot study) and to determine whether the scores on these instruments are predictive of success in remedial-compensatory or 100-level mathematics, reading, or English courses (the major study). In this chapter, a small group of 75 students per year (1969-75) was selected to determine the reliability of the mathematics and reading tests. As an ancillary effort in this study, this same sample was also used to develop statistics relative to the need for and cost of remedial-compensatory education at EPCC.

In Chapter VI (the major study), the placement test scores of approximately 10% of the students enrolled in the spring term for the last three academic years were correlated with sixteen other variables to determine the success of these scores in predicting student grades in remedial-compensatory and 100-level courses. In addition, data on the variables of age, sex, ethnic characteristics, and EPCC academic major were analyzed to see if any of these factors was related to remedial-compensatory enrollment or success in Skills or certain 100-level courses. Additionally, the four variables of student type, employment status at EPCC enrollment, financial status, and residency were analyzed to determine what relationship, if any, existed between them and student success in either remedial-compensatory or 100-level courses.

Reliability of the Placement Test Battery

The placement test battery administered to entering EPCC students consists of the SRA Diagnostic Reading Test, a locally prepared Mathematics

Placement Test Battery, and a writing sample. Since only a single rating is assigned to the writing sample for placement into the appropriate compensatory or English 100-level course, no estimate of reliability can be directly computed.

For the Mathematics and Reading Test Batteries, individual test items were available for analysis and reliability computation. The Kuder-Richardson Formula Number 20 (KR-20), as an estimate of reliability, was employed on data from a sample of each of the last six spring terms (1969-1975) at EPCC. In educational testing and measurement circles, reliability is that quality of a test which is concerned with consistent results. The researcher has the option of determining either of two kinds of coefficient of reliability. The first is called a "coefficient of stability" in which the test is administered twice to the same group; the correlational coefficient between each student's first and second tests becomes the reliability coefficient. The second method is called the "coefficient of equivalence" which employs (1) the correlation between the odd and even numbered items on the test, (2) the correlation between the scores made on the first and second halves of the test, or (3) the application of internal consistency formulas to test results on a single administration of the test. The KR-20 estimate of reliability used in this study represents the reliability coefficient of equivalence.

The six class samples of 75 randomly selected students represented a maximum sample size of 450 for the 1969-75 sample composite. There were data on the following: 425 English placement scores (94.44%), 375 mathematics scores (83.33%), and 434 reading scores (96.44%).

Mathematics Placement Test Battery

The Mathematics Placement Test Battery (MPTB) has taken two separate forms in the last six years. During academic years 1969-70 and 1970-71, a single 36-item test was administered to entering EPCC students. This test covered addition and subtraction of whole numbers, multiplication and division of whole numbers, fractions, decimals, percentage, and elementary algebra. On the basis of the student's success on the MPTB, the student was assigned to Mat 010 (equivalent to grades 1-8 mathematics level), Mat 020 (equivalent to grades 9 & 10), Mat 030 (equivalent to grades 11 & 12), or Mat 040* (equivalent to college-level mathematics). The raw and reliability data are contained in Table I.

TABLE I

RAW MATH DATA, RELIABILITY ESTIMATES, AND STANDARD ERROR OF MEASUREMENT DATA FOR 1969-70 AND 1970-71 SAMPLES

YEAR	N	RAW DATA		RELIABILITY	
		MEAN	STANDARD DEVIATION	36-ITEMS	50-ITEMS
1969-70	71	10.08	6.51	.894	.921
1970-71	74	11.91	8.59	.939	.955
TOTAL 1969-71	145	11.01	7.70	.923	.943
STANDARD ERROR OF MEASUREMENT 1969-1971				2.14	

*This course, relabeled as Mat 100 in 1973 because of its college-level curriculum, is now taught in the Mathematics and Science Department.

An analysis of the data in Table I suggests that the EPCC entering student was presented with an extremely difficult task as evidenced by the mean score (arithmetic average) of 11.01 on the 36-item test (30.58%). The full test reliability of .923 for the two years represents a highly reliable test. Interpretation of reliability coefficients follow these rules of thumb: (1) the higher, the better; (2) for nationally-normed tests, .80 or higher; and (3) for locally-normed tests, .70 or higher. The .894 and .939 coefficients similarly reflect a high level of small individual variation. The magnitude of a given reliability coefficient is limited as a function of the test length. To compare the various reliability coefficients calculated against sub-tests of various test length, a 50-item standard was accepted. For this purpose, the Spearman-Brown Prophecy Formula was applied to KR-20 reliabilities for sub-tests containing fewer or more than 50 items. The .921 and .955 individual year reliabilities reveal that the MPTB was a highly reliable instrument. Similarly, the .943 two-year composite reliability estimate yields the same reliability conclusion.

The standard error of measurement is a statistical value which establishes the confidence that a test interpreter can have that the obtained student score approximates the true score that the student would make if he took the same test more times. According to probability theory, one standard error of measurement added to or subtracted from the student score allows one to make the following statement: "The chances are approximately 67 in 100 that the student's true score lies within a range of plus or minus one standard error of measurement from the student-obtained score." In this instance, the odds are 2:1 in favor of the

student's true score falling within the one standard error of measurement range of the obtained scores. Using the same logic in probability theory, the chances of a student's true score lying within two standard errors of measurement are 95 in 100 or 19:1 odds. For three standard errors of measurement range, the probability becomes 99 in 100 or 99:1 odds. The highly respected Stanford-Binet has a standard error of measurement of 4.8, which is approximately 30% of its standard deviation. The relation between the obtained standard error of measurement value of 2.14 and the standard deviation of 7.70 for the 1969-71 MPTB (27.79%) suggests that interpreters can have high confidence in the obtained student scores.

During the 1970-71 school year the Skills Mathematics staff developed four twenty-item sub-tests for the MPTB. From Test I to Test IV, the mathematical sophistication level increases from the manipulation of whole numbers to second year algebra. Data on the four part MPTB from 1971-75 are contained in Table II.

Of the 300 maximum possible students in the four years from 1971-1975, 230 students (76.67%) have data on Part I, 55 students (18.33%) have data on part II, 12 students (4%) have data on Part III, and 9 students (3%) have data on Part IV of the MPTB. Even though complete data were computed for all four parts of the MPTB, when the sample of students (N) is less than 35 students, the data should be regarded cautiously.

The average scores of 10.29, 7.53, 7.67, and 8.44 attained by the student sample over the four years represent student performance of 51.45%, 37.65%, 38.35%, and 42.20% respectively on the four sub-tests. These achievement levels, although not very high, represent a significant increase over the 30.58% achievement on the single 36-item test administered during 1969-71. The 20-item reliabilities of .861, .881, .904, and .882 portray the sub-tests as highly reliable measuring instruments. Similarly,

TABLE II

MEANS, STANDARD DEVIATIONS, RELIABILITY COEFFICIENTS, AND STANDARD ERROR OF MEASUREMENT DATA FOR THE MATHEMATICS PLACEMENT TEST FROM 1971-1975

YEAR	PART I					PART II					PART III					PART IV				
	N	MEAN	STD DEV	r20	r50	N	MEAN	STD DEV	r20	r50	N	MEAN	STD DEV	r20	r50	N	MEAN	STD DEV	r20	r50
1971-72	35	12.06	4.53	.854	.936	15	6.67	3.99	.946	.978	3	--	--	-	-	4	--	--	-	-
1972-73	62	9.81	4.67	.856	.937	13	10.23	4.64	.876	.946	5	--	--	-	-	3	--	--	-	-
1973-74	72	9.02	4.95	.876	.946	8	7.38	4.95	.900	.957	0	--	--	-	-	1	--	--	-	-
1974-75	61	10.69	4.87	.873	.945	19	6.42	4.20	.861	.939	4	--	--	-	-	1	--	--	-	-
TOTAL 1971-75	230	10.29	4.80	.861	.939	55	7.53	4.63	.881	.949	12	7.67	5.09	.904	.959	9	8.44	4.04	.822	.920
STANDARD ERROR OF MEASUREMENT	1.79					2.60					1.58					1.70				

the 50-item inferred reliabilities of .939, .949, .959, and .929 reflect a high level of reliability in the four part test battery. Because the sample sizes for the Parts III and IV sub-tests were less than 35, these reliability coefficients, although high, should be regarded as tentative until a further study can increase the number of students analyzed to more than 35 for each part.

The obtained standard errors of measurement of 1.79, 2.60, 1.58, and 1.70 reflect the following percentages of their standard deviations: 37.3%, 34.5%, 31.0%, and 42.2% respectively. Parts I and II fall into the high confidence level. Although in Parts III and IV sample size consideration would suggest caution, Part III appears to be acceptable; Part IV shows a tendency toward being excessive.

Reading Placement Test*

The reading staff of EPCC's Skills Department selected the Diagnostic Reading Test (DRT), a nationally norm-referenced instrument distributed by Science Research Associates, Inc. The test battery includes a timed reading section which establishes a student's reading rate and 100 multiple choice items divided so that 40 items measure two components of reading comprehension and 60 items measure vocabulary. An RC score is obtained by multiplying the reading rate (R) score by the 100-item test comprehension (C) score.

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*Since the SRA Diagnostic Reading Test is used as the Reading Placement Test, consider these terms interchangeable since the use of one implies the use of the other.

The raw data for the comprehension section of the test are presented in Table III.

TABLE III

DIAGNOSTIC READING TEST RAW DATA FOR READING COMPREHENSION AND NATIONAL NORM COMPARISONS

ACADEMIC YEAR	N	PART I GENERAL READING (ITEMS 1-20)			PART III COMPREHENSION (ITEMS 81-100)			PARTS I & II TOTAL COMP (1-20 & 81-100)		
		MEAN	STD DEV	%ILE	MEAN	STD DEV	%ILE	MEAN	STD DEV	%ILE
1969-70	67	13.64	4.50	24	13.48	3.32	24	26.67	7.36	22
1970-71	72	12.72	4.51	20	13.10	4.10	20	25.49	8.32	16
1971-72	75	13.92	4.40	24	13.13	3.52	24	27.37	7.70	25
1972-73	72	14.10	3.57	24	12.76	3.21	24	27.13	6.23	25
1973-74	75	13.29	4.23	13	11.12	3.83	13	24.54	7.28	16
1974-75	73	13.40	3.44	20	12.14	3.54	20	25.70	6.04	19
TOTAL 1969-75	434	13.49	4.12	20	12.58	3.73	20	26.06	7.27	20

The "%ile" column in Table III represents the percentile rank for each mean student score contained in the table. For example, the 13.64 mean score for the 67 students in the 1969-70 class in Part I places their achievement at the 24% of the 16,604 people on whom Science Research Associates normed test results in 1953.

Throughout the six academic years, the sample comprehension scores have decreased from the 25%ile (lowest quarter) to the 19%ile (approximately lowest fifth). It should be noted that with these mean scores, an overwhelming majority of entering students would require some form of remedial

reading assistance so they can understand what they will read at the entering college level.

Raw data and percentiles for all scores used in the Reading Placement Test are contained in Table IV.

An analysis of the data contained in Table IV suggests that the Vocabulary, Total Comprehension, and Total Score achievement of EPCC students places them in the lowest fifth to lowest sixth of the national population of entering freshman students.

The Reading Rate score represents a subjective component in the DRT battery. The student is asked to read a selection for an exact timed period. They are then asked to write the line number that they were reading when time expired. Error can be introduced in at least one or two ways. First, the student knows that he is taking a timed reading test and may tend to read hastily and carelessly. Second, no matter how fast the student actually reads, one must place 100% faith in honesty of the correct line number at the end of the timed period. Similarly, the RC score is obtained by combining the subjective Reading Rate score and the 100-item objective test score. The 42%ile rank for Reading Rate would tend to place the six year average close to the 50%ile of national norms. The 30%ile RC (Rate & Comprehension) score over the six years places the reading efficiency in the lower third to fourth of entering college freshmen nationwide.

The reliability coefficients and standard error of measurement data for six years of EPCC entering students are contained in Table V.

Analyses of the reliability data in Table V reveal that the test is highly reliable. The .802 for Part I, .875 for Total Comprehension, .934 for Vocabulary, and .959 for Total 100-test items correspond quite closely

TABLE IV

DIAGNOSTIC READING TEST RAW DATA AND NATIONAL NORM COMPARISONS

YEAR	N	READING RATE (WORDS/MINUTE)			VOCABULARY			TOTAL COMPREHENSION			TOTAL SCORE			RC (RATE X COMPREHENSION)		
		MEAN	STD DEV	% ile	MEAN	STD DEV	% ile	MEAN	STD DEV	% ile	MEAN	STD DEV	% ile	MEAN	STD DEV	%ile
1969-70	67	272.46	62.58	43	37.28	10.15	24	26.67	7.36	22	63.87	17.33	20	182.96	73.50	34
1970-71	72	269.66	70.32	41	36.41	11.69	21	25.49	8.32	16	63.50	17.89	20	191.51	79.80	39
1971-72	75	286.06	98.50	51	38.74	11.82	30	27.37	7.70	25	65.97	18.42	24	195.92	98.81	41
1972-73	72	267.74	63.01	39	35.43	9.82	19	27.13	6.23	25	62.43	14.06	17	171.74	69.45	30
1973-74	75	258.46	69.86	33	31.74	9.73	12	24.54	7.28	16	55.33	16.70	8	152.09	72.57	21
1974-75	73	270.94	77.24	42	33.69	9.08	16	25.70	6.04	19	57.98	14.35	11	160.73	65.34	24
TOTAL 1969-75	434	270.74	75.14	42	35.49	10.70	19	26.06	7.27	20	60.19	16.88	14	173.12	77.82	30

TABLE V

RELIABILITY OF COMPONENT SUBTESTS AND TOTAL SCORE ON DIAGNOSTIC READING TEST AS WELL AS 50-ITEM RELIABILITY COEFFICIENTS

ACADEMIC YEAR	N	PART I GENERAL COMP. 20 ITEMS	PART III COMPREHENSION 20 ITEMS	PART I & III TOTAL COMPREH. 40 ITEMS	PART II VOCABULARY 60 ITEMS	TOTAL READING SCORE 100 ITEMS
1969-70	67	.841	.701	.883	.930	.955
1970-71	72	.839	.817	.907	.948	.956
1971-72	75	.838	.751	.896	.945	.958
1972-73	72	.740	.696	.833	.927	.944
1973-74	75	.818	.780	.898	.925	.951
1974-75	73	.698	.741	.809	.912	.931
TOTAL 1969-75	434	.802	.772	.875	.934	.950
STD ERROR OF MEAS.1969-75	--	1.83	1.82	2.57	2.71	3.77

ACADEMIC YEAR	N	50 ITEM r PART I	50 ITEM r PART III	50 ITEM r TOTAL COMP.	50 ITEM r VOCABULARY	50 ITEM r TOTAL READING SCORE
1969-70	67	.930	.854	.904	.917	.914
1970-71	72	.929	.918	.924	.938	.916
1971-72	75	.928	.883	.915	.935	.919
1972-73	72	.877	.851	.862	.914	.894
1973-74	75	.918	.899	.909	.911	.907
1974-75	73	.852	.877	.841	.896	.871
TOTAL 1969-75	434	.910	.894	.897	.922	.905

to the .74, .83, .89, .91, respectively, which are reported by Science Research Associate, Inc., in its test norming bulletin. Similarly, the 50-item reliabilities reported in the Total row of Table V all approximate or exceed .90 and tend to reinforce the reliability of the DRT on EPCC entering students over the last six years.

The standard errors of measurement of 1.83 for Part I and 1.82 for Part III represent 44.17% and 48.79%, respectively, of their standard deviations. These particular part scores are not used at EPCC for placement purposes. The 2.57 standard error of measurement for Total Comprehension, 2.71 for Vocabulary, and 3.77 for Total Score represent 35.35%, 25.33%, and 22.33%, respectively, of their standard deviations. The Total Score is applied to the Reading Rate to yield the RC score which is used for student placement.

The national reading profiles on EPCC students enrolled during 1969-72 and 1972-75 are contained in Table VI. An analysis of these two profiles suggests that the 1972-75 enrollees were significantly more in need of reading skills instruction than their 1969-72 counterparts. The national rankings along the five reading scales for the 1972-75 composite also reflect a greater need for individual instruction than for students in the 1969-72 group. This trend toward declining academic achievement was referenced earlier in the review of literature (pp.35-37).

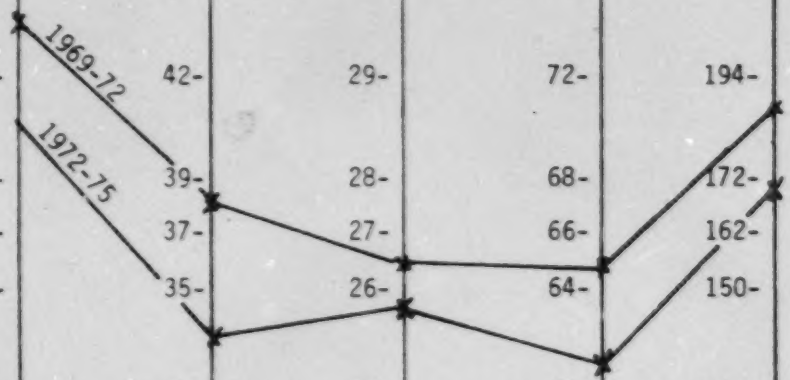
Placement of Students in the Reliability Sample

An analysis of the reading data above revealed that entering EPCC students from 1972-75 differed from their 1969-72 counterparts. As a result of the scores made on the placement tests, the students were counseled to register for either remedial-compensatory or 100-level courses in English, mathematics, and reading. For 1969-72 and 1972-75 composite samples, these placement data are presented and statistically compared by Chi Square analysis in Table VII.

TABLE VI

1969-72 AND 1972-75 READING DATA AND NATIONAL NORMS

NATIONAL PERCENTILE	WORDS PER MINUTE	VOCABULARY	TOTAL COMPREHENSION	TOTAL SCORE	RC (READING RATE TIMES COMPREHENSION	NATIONAL PERCENTILE
99-	475-	59-	39-	96-	456-	99-
95-	405-	56-	37-	92-	373-	95-
90-	370-	55-	36-	90-	333-	90-
80-	338-	52-	34-	86-	290-	80-
75-	325-	51-	34-	84-	273-	75-
70-	317-	49-	33-	83-	263-	70-
60-	296-	47-	32-	79-	236-	60-
50-	285-	44-	31-	76-	217-	50-
40-	269-	42-	29-	72-	194-	40-
30-	253-	39-	28-	68-	172-	30-
25-	245-	37-	27-	66-	162-	25-
20-	235-	35-	26-	64-	150-	20-
10-	218-	31-	23-	57-	124-	10-
5-	200-	28-	20-	51-	102-	5-
1-	175-	21-	14-	39-	68-	1-



NATIONAL AVERAGE	285	44	31	76	217	NATIONAL AVERAGE
1969-72/1972-75 EPCC AVERAGES	276/265	38/33	263/258	64/58	158/170	EPCC AVERAGE
1969-72/1972-75 EPCC PERCENTILES	45/38	27/14	21/19	21/12	35/28	EPCC %ILES

TABLE VII

CHI SQUARE ANALYSIS OF STUDENT PLACEMENT FROM PLACEMENT SCORES IN ENGLISH, MATHEMATICS, AND READING COURSES FOR YEARS 1969-72 AND 1972-75 58

ENGLISH courses / YEAR	ENL 010	ENL 020	ENL 050	ENL 101	TOTAL	X^2	p.
1969-72	11 (9.79)	12 (27.41)	81 (87.69)	104 (83.20)	208		
1972-75	9 (10.25)	44 (28.59)	98 (91.40)	66 (86.80)	217		
TOTAL	20	56	179	170	425	*** 28.44	<.001

df = 3 *p.05 = 7.82; **p.01 = 11.34; ***p.001 = 16.27

Expected values are in parentheses

MATH COURSES / YEAR	MATH 010	MATH 020	MATH 030,040,050	MATH 100,101,151	TOTAL
1969-72	58 (84.89)	95 (79.70)	12 (12.26)	26 (14.15)	191
1972-75	122 (95.11)	74 (89.30)	14 (13.74)	4 (15.85)	214
TOTAL	180	169	26	30	405

*** 40.47 <.001

df = 3 *p.05 = 7.82; **p.01 = 11.34; ***p.001 = 16.27

READING COURSES / YEAR	REA 010,020	REA 050	REA 100,101,102	TOTAL
1969-72	62 (72.98)	74 (81.85)	78 (59.17)	214
72-75	86 (75.02)	92 (84.15)	42 (60.83)	220
TOTAL	148	166	120	434

*** 16.57 <.001

df = 2 *p.05 = 5.99; **p.01 = 9.21; ***p.001 = 13.82

English:

(1) In the 1969-72 sample, 50% were placed in 100-level English courses. In the 1972-75 sample, only 30.41% were placed in 100-level English courses.

(2) For 1969-72 entering students, 5.77% were placed in Enl 020; whereas, for 1972-75 entering students, 20.28% were so placed.

(3) In the 1969-72 sample, 50% required one or more compensatory English courses. In the 1972-75 sample, 69.59% required one or more compensatory English classes.

Mathematics:

(1) In the 1969-72 sample 13.61% were placed into 100-level mathematics courses, whereas, in the 1972-75 sample only 1.8% were so placed.

(2) For the 1969-72 entering EPCC students who took placement tests, 86.38% required one or more compensatory mathematics courses. For the 1972-75 sample, the percentage of the students requiring one or more compensatory mathematics courses increased to 98.13%

Reading:

(1) For the 1969-72 sample, 36.45% were placed in 100-level reading courses. For the 1972-75 sample, this number was reduced to 19.09%.

(2) In the 1969-72 sample, 63.55% of the students required one or more compensatory reading courses. For the 1972-75 sample, 80.91% of the students required one or more compensatory reading courses.

These placement data also reflect an increased need on the part of entering students for individual assistance from their remedial-compensatory

course instructors. Clearly, a lower student-teacher ratio is necessary for satisfying compensatory student needs for the 1972-75 students than was needed for their 1969-72 counterparts.

Ease indexes for the reading and mathematics test items are contained in Appendix A.

The Need for Remedial-Compensatory Courses at EPCC

The data in Table VII were used as a basis for determining the need for remedial-compensatory courses at EPCC as determined against the sample drawn for the reliability portion of the study. Based upon data obtained from the EPCC Testing Office, there were 1889 students tested in 1972-73, 2714 tested in 1973-74, and 5461 tested in 1974-75. If a student's placement test score assigned him to an 010-level course, that student would generally need to take three Skills courses before his achievement level would be high enough to compete successfully at the 100-level course in mathematics, English, or reading. Similarly, students initially placed at the 020-level would have to take two Skills courses, and those students initially placed in Mat 030, Enl 050, or Rea 050 would have to complete one Skills course before their functioning ability in that discipline would be at the collegiate 100-level.

The proportionate percentage of student enrollment at the three Skills levels for mathematics, English, and reading were computed on the 1973-75 data in Table VII. The data for determining the EPCC student need for remedial-compensatory courses are presented in Table VIII.

The college tests students continually throughout the twelve-month academic year. There are some students who cannot complete their remedial-compensatory courses in the same school year in which they were tested.

TABLE VIII

DETERMINATION OF STUDENT NEED FOR COMPENSATORY EDUCATION COURSES AT EPCC AND THE PER CENT OF STUDENT NEED PROVIDED BY EPCC SKILLS DEPARTMENT

DUPLICATED COUNT	FY 72-73				FY 73-74				FY 74-75				FALL TERM FY 75-76			
	ENL	MATH	REA	TOTAL	ENL	MATH	REA	TOTAL	ENL	MATH	REA	TOTAL	ENL	MATH	REA	TOTAL
STUDENT NEED	1854	4008	2267	8129	2664	6655	3257	12,616	5480	13,474	6553	25,507	1419	3453	1739	6611
% CARRYOVER PREVIOUS YEAR	464	1002	567	2032	464	1002	567	2032	666	1674	814	3154	343	842	410	1595
TOTAL STUDENT NEED	2318	5010	2834	10,161	3128	7698	3824	14,648	6146	15,148	7367	28,661	1762	4295	2149	8206
STUDENT FTE BASED ON TOTAL NEED	206	445.3	251.9	903.2	278	864	340	1,302	546	1347	655	2,548	156.62	381.78	191.02	729.42
ACTUAL STUDENT FTE FUNDED	80	106.89	80	266.89	129.66	172.88	129.66	432.2	161.45	215.27	161.45	538.18	37.24	58.22	41.51	136.97
% OF NEED SERVED BY SKILLS COURSES	38.83%	24.00%	31.76%	29.55%	46.64%	20.01%	38.14%	33.20%	29.57%	15.98%	24.65%	21.12%	23.78%	15.25%	21.73%	18.78%

UNDUPLICATED COUNT	FY 72-73				FY 73-74				FY 74-75				FALL TERM FY 75-76*			
	ENL	MATH	REA	TOTAL	ENL	MATH	REA	TOTAL	ENL	MATH	REA	TOTAL	ENL	MATH	REA	TOTAL
TOTAL STUDENT NEED	1314.55	1853.68	1528.39	4696.62	1888.67	2663.25	2195.90	6747.82	3800.31	5358.88	4418.50	13577.69	1189	1471	1138	3798
STUDENT FTE BASED TOTAL STUDENT NEED	116.85	164.77	135.86	417.48	167.88	236.73	195.19	599.80	337.81	476.34	392.76	1206.91	105.69	130.76	101.16	337.60
ACTUAL STUDENT FTE FUNDED	80	106.89	80	266.89	129.66	172.88	129.66	432.20	161.45	215.27	161.45	538.18	37.24	58.22	41.51	136.97
% OF NEED SERVED BY SKILLS	68.46%	64.87%	58.88%	63.93%	77.23%	73.03%	66.43%	72.06%	47.79%	45.19%	41.11%	44.59%	35.24%	44.52%	41.03%	40.57%

* THE CARRYOVER FOR THE FY 75-76 FALL TERM WAS COMPUTED AS 1/16th OF THE FY 74-75 STUDENT NEED.

Recognizing this fact, a student-need carryover of 25% was computed based upon the previous year's student-need to more adequately reflect the real compensatory needs of students in a given academic year.

The "Total Student Need" row of Table VIII reflects the number of Skills Studies enrollments accruing from the students tested in that academic year, plus the 25% carryover from the previous academic year.

Since all remedial-compensatory courses at EPCC carry four quarter hours credit, the total student FTE was computed by multiplying the Total Student Need value by 4 and dividing that product by 45.

The "Actual Student FTE Funded" row of Table VIII reflects the funding levels for mathematics, English, and reading from FY 73-75. The "Per Cent of Need Served by Skills Courses" is obtained by dividing the Actual Student FTE by the Student FTE Need and multiplying that value by 100. As the reader can readily see, a student is counted more than once in the first half of Table VIII as the extent of student offerings are determined. This represents a duplicated count.

A case can be made that if a student needed three compensatory math courses to raise his mathematics skills to the collegiate level, and if enrolled in one compensatory mathematics course for each of three successive academic quarters, the college would have satisfied 100% of his need for compensatory mathematics during those quarters. To satisfy this legitimate criticism of the duplicated count, an unduplicated count of student need for remedial-compensatory EPCC courses also is presented in the lower portion of Table VIII.

An analysis of the unduplicated data in Table VIII suggests that the per cent of student need accommodated by EPCC Skills courses has steadily declined

during the fiscal year (FY) period 73-75. The fall term data for FY '76 indicate that the decline has leveled off. For the three course content areas, there was an increase in the percentage of need served in FY '74 over FY '73, but the FY '75 data not only erode the FY '74 progress, but also the FY '73 baseline data. These data are graphically displayed in Table IX.

Remedial-Compensatory Program Cost Analysis

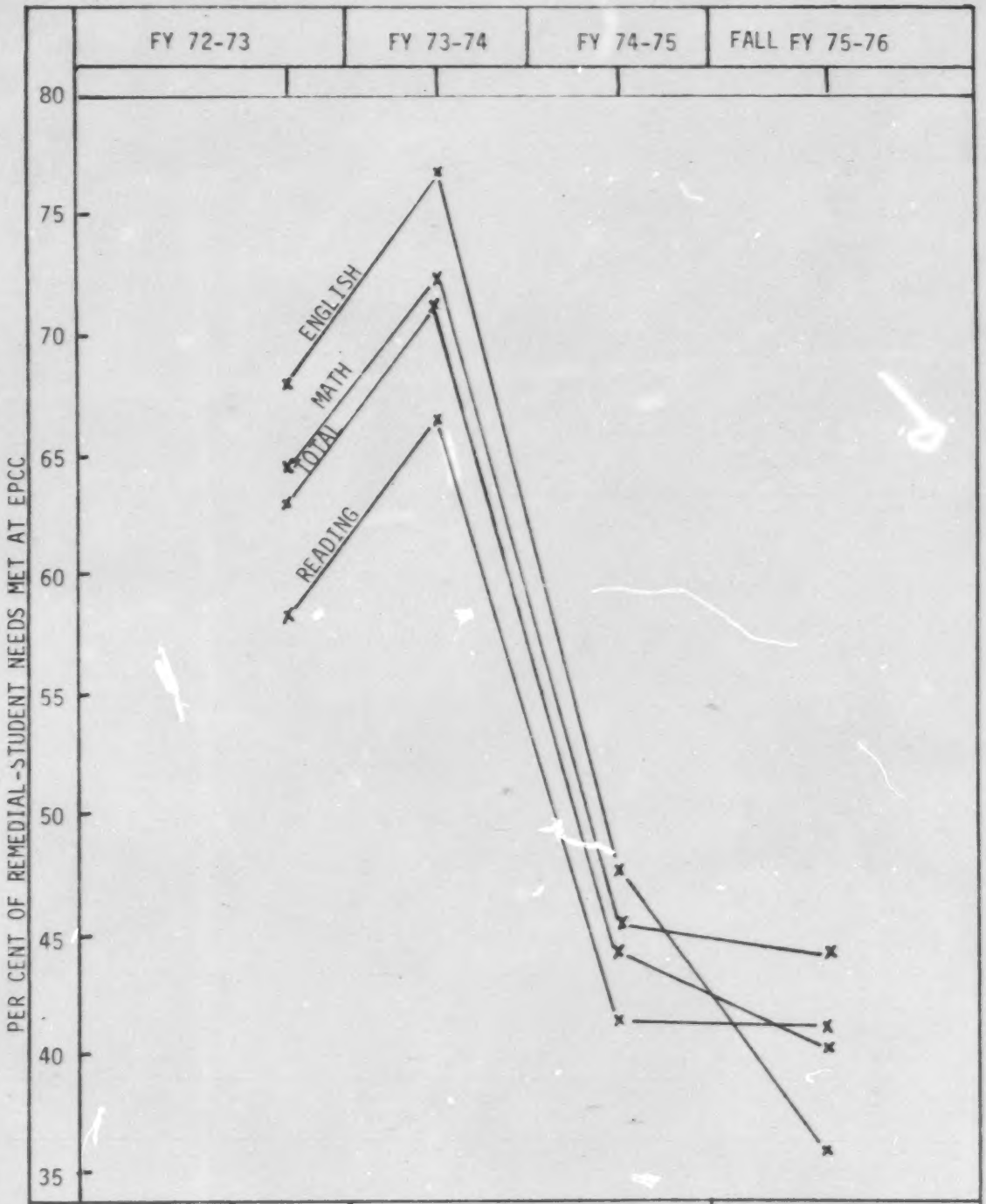
Per student costs for the last budgetary year (FY '75), the present operation year (FY '76), and the present budgetary year (FY '77) are presented in Table X.

Over the three budgetary years the student-teacher ratio has been reduced from 29:1 to 21:1. The remedial instruction budget for FY '77 represents a 69.04% increase over the FY '75 baseline data. During this same period the budgeted student FTE generated by remedial instruction increased by 2.2%. This minimal increase in student-FTE-generated remedial instruction accounts for the rather dramatic 65.41% increase in remedial instruction cost per student FTE. In FY '75, the remedial instruction student FTE represented approximately 12.7% of the entire student FTE at EPCC. In contrast, as the EPCC student FTE increased significantly over these three fiscal years, the FY '77 skills student FTE of 550 represents approximately 10% of the student FTE and, therefore, a reduction in student coverage.

While the total institutional cost per student FTE increased 42.51% over the three fiscal years, the remedial instruction cost/student FTE increased 8.66% from 53.95% to 62.61%--the proportionate total institutional cost/student FTE. Had the student FTE generated by remedial instruction

TABLE 1A

PER CENT OF REMEDIAL-COMPENSATORY STUDENT NEEDS MET AT EPCC FROM FY '73 TO FALL TERM FY '76 (UNDUPLICATED COUNT)



ENGLISH	68.46	77.23	47.79	35.24
MATH	64.87	73.03	45.19	44.52
READING	58.88	66.43	41.11	41.03
TOTAL	63.93	72.06	44.59	40.57

TABLE X

PER STUDENT COST COMPARISONS BETWEEN REMEDIAL INSTRUCTION AND TOTAL INSTITUTIONAL COSTS FOR FY's '75 THROUGH '77

Fiscal Year	Remedial Instruction Student-Teacher Ratio	Remedial Instruction Budget	Student FTE Generated By Remedial Instruction	Cost/Student FTE Remedial Instruction	Cost/Student FTE Total Instructional Budget	Percent of Remedial Instruction To Total Instruction-al Budget
1974-75	29:1	$273,199	538.18	$507.63	$ 941	53.95
1975-76	28:1	$316,935	540.00	$586.92	$1048	56.00
1976-77	21:1	$461,809	550.00	$839.65*	$1341	62.61

*For a detailed analysis regarding cost increase between 74-75 and 76-77, see page 62.

been allowed to increase at the rate of 5% per budget year, the cost/student FTE for remedial instruction would be approximately $780, or 58.17% of the FY '77 total institutional cost/student FTE.

CHAPTER VI

THE MAJOR STUDY

Introduction

After the reliability sample was selected and analyzed to yield reliability estimates, the need for compensatory course offerings, and an analysis of budgetary data to provide remedial instruction cost/student information, an approximate 10% sample of classes 1972-73, 1973-74, and 1974-75 was chosen to ascertain the validity of the English, mathematics, and reading placement instruments and to measure the relevance of compensatory courses as preparation vehicles for the college level courses in the nine academic departments at EPCC. These data were also analyzed against a series of demographic variables of entering EPCC students.

Validity of the Placement Test Battery

Validity is that characteristic of a good test which seeks to answer the question, "Does the test measure what it was intended to measure, and nothing else?" Basically, there are four kinds of validity: content construct, congruent, and predictive.

Content (or face) validity is determined by ascertaining whether the information tested by the instrument corresponds to the course content to be measured. The four parts of the Mathematics Placement Test Battery (MPTB) contain questions which measure the student's capacity to perform simple arithmetic functions with whole numbers, ability to calculate and apply the fundamental mathematics processes to fractions and decimal equivalents, knowledge of first year algebra processes and procedures, and application of second year algebra concepts and procedures. Teachers from both the EPCC Mathematics/Science and Skills Departments have agreed that the individual items on each subtest measure the competencies taught in

the three Skills mathematics courses.

Construct validity, usually determined by statistical factor analysis, describes the degree to which a group or cluster of test items measure some psychological attribute. For example, in attitudinal measurement the various motivational factors which a test was designed to measure are validated through statistical prodedures. The EPCC placement tests do not lend themselves to construct validity. Similarly, congruent validity represents the relationship which exists between a locally prepared test and some nationally recognized standard. Congruent validity is not feasible as a measure of validity for the MPTB, but the SRA Diagnostic Reading Test is a nationally recognized standard against which other nationally normed reading tests have been validated. The reported average item validity of .53 (biserial correlation) is reported in the SRA Norms Manual for the test.

Predictive validity is concerned with answering the question, "How well do the results on a given test indicate some future success or proficiency level?" The mathematics, reading, and English placement tests results are used for student assignment in either Skills or 100-level courses. For this reason, a significant portion of the analysis in the major study was devoted to the predictive validity of these instruments.

Predictive Validity of the Mathematics Placement Test Battery (MPTB)

The MPTB scores were correlated with grades made by students in both Skills and 100-level mathematics courses. The student alphanumeric grades were translated into numerical values by the following equivalent scores: A = 95, B = 85, C = 75, D = 65. The predictive validities for Skills mathematics and 100-level courses are contained in Table XI.

Since data in "Highest Grade Completed" and "Years Since High School

TABLE XI

PREDICTIVE VALIDITIES OF SELECTED VARIABLES AND SUCCESS

IN COMPENSATORY AND 100-LEVEL MATHEMATICS COURSES

GROUP	Course	Highest Grade Completed	Years Since High School Graduation	English Placement Score	Reading Placement Score	Mathematics Placement Score
Experimental (Students with Compensatory Math courses)	Mat 010	.024 (55)	- .181 (54)	-.092 (56)	.135 (57)	.132 (58)
	Mat 020	.359*** (67)	-.105 (61)	-.274* (61)	.429*** (65)	.338** (70)
	Mat 030	-.042 (27)	.036 (19)	.504** (25)	.287 (25)	.206 (27)
	Mat 100	-.054 (85)	-.063 (78)	.436*** (81)	.458*** (83)	.374*** (87)
Control (No Compensatory courses)	Mat 100	.060 (87)	-.108 (78)	.221* (82)	.325*** (86)	.183* (90)

Values in parentheses represent the number of pairs of scores compared.
*p=.05; **p=.01; ***p=.001

Graduation" data are also available at the time an entering EPCC student takes the Mathematics Placement Test Battery, these correlations also are reported in Table XI. Also, since the prediction of future success in mathematics courses is of prime importance, the correlation between mathematics success and both English and reading placement scores also are included in Table XI.

Before analysis of the predictive validities reported in Table XI is undertaken, some discussion of the MPTB score is in order. Under current EPCC testing protocols, the tester advises the student on the content of the four parts of the test. If the student feels that he can handle whole number mathematical manipulation, he skips Part I and may take Part II, or Parts II and III, etc. Thus, a numeric ambiguity is introduced when one takes the total MPTB score and tries to correlate it with anything. One student could have a score of 18 on Part I. Another might have a score of 15, which might represent a score of 8 on Part II and 7 on Part III. Should the second student be given 20 points credit for not taking Part I? (In fact, if the student did take Part I, would he have made a perfect score?) This inconsistent scoring scheme makes the correlation with lowest and middle level mathematics placement somewhat biased and inconsistent. As the magnitude of the obtained MPTB score increases, however, the distortion of the correlation with the 100-level course success would tend to be minimized.

An analysis of the predictive validities in Table XI reveals the following:

a. There is no statistically significant predictor of Mat 010 success.

b. The MPTB score significantly predicts success in Mat 020. Signif-

icant prediction also is evident for the variables Highest Grade Completed, English Placement Score, and Reading Placement Score.

c. The English Placement Score is the only predictor of Mat 030 success.

d. For both the experimental and control groups, the Mathematics, English, and Reading Placement Test Scores significantly predict success in Mat 100.

To compare the effectiveness of any difference in magnitude between the obtained correlations for the experimental and control groups, these data were compared by the significance of a difference in correlation statistic. The obtained values of 1.52, 1.00, and 1.35 for English, reading, and mathematics placement scores for Mat 100 success are not statistically significant. This fact means that although the three experimental group correlations are numerically higher than the control group correlations, their difference in magnitude is not statistically significant.

To assist the reader in interpreting predictive validities, it should be noted that the best predictive instruments for future success have correlations in the order of .40 - .60 with the success being predicted. Thus, for the experimental group, the English and DRT scores are within this range, whereas the MPTB score approaches it. The three control group correlations do not fall in the .40 - .60 range. This fact might be because students who score high on the MPTB have a more homogeneous distribution, and therefore the magnitude of the correlations is diminished accordingly.

Predictive Validity of the English Placement Test

The predictive validities for English placement test score and success in Skills English and 100-level courses are contained in Table XII.

TABLE XII

PREDICTIVE VALIDITIES OF SELECTED VARIABLES AND SUCCESS IN COMPENSATORY AND 100-LEVEL ENGLISH COURSES

Group	Course	Highest Grade Completed	Years Since High School Graduation	English Placement Score	Reading Placement Score	Mathematics Placement Score
Experimental (Students with Compensatory English Courses)	Enl 010	.000 (9)	-.185 (9)	.612* (8)	-.069 (8)	.312 (8)
	Enl 020	.291 (15)	.240 (14)	.000 (16)	.508* (15)	.139 (14)
	Enl 030	.000 (15)	.363 (15)	-.115 (15)	-.199 (15)	-.261 (13)
	Enl 050	.163 (47)	.372* (34)	-.076 (46)	.144 (45)	.063 (44)
	Enl 100	.162 (55)	.202 (43)	.073 (56)	.083 (55)	.215 (52)
Control (No compensatory courses)	Enl 100	.054 (211)	.015 (176)	.234*** (208)	.196** (207)	.122* (193)

Values in parentheses represent the number of pairs of scores compared.
*p=.05; **p=.01; ***p=.001

Entering EPCC students are required to write a theme of their choosing to determine their ability to: (1) organize their thoughts in some logical way; (2) express their thoughts coherently; and (3) employ the mechanics of sentence structure, grammar, and spelling. The faculty of the EPCC Communications/Humanities and Skills Departments have mutually agreed on the criteria for placement. The professional in the Testing Office reads each student's theme, applies the criteria, and places that student in the appropriate remedial-compensatory or 100-level English course. Spelling errors are also noted; if they are found to be excessive, the students will be placed in the Enl 030 Spelling course. For the past two years, the Skills and Communications/Humanities faculties have been totally satisfied with the placement procedure in English courses.

For validity purposes, the course designation was used to generate an English placement score. Students enrolled in Enl 010 were assigned the value 1, Enl 020 = 2, Enl 030 = 3, and Enl 100 = 4. The English Placement Score validities in Table XII reflect this quantitative substitution.

An analysis of the predictive validities in Table XII reflects this quantitative substitution and suggests the following:

a. The English Placement Score significantly predicts Enl 010 success.

b. The Reading Placement Score significantly predicts Enl 020 success

c. None of the variables selected predicts Enl 030 success.

d. "Years Since High School Graduation" is the sole significant predictor of Enl 050 success.

e. None of the variables selected predicted Enl 100 success for experimental students.

f. The English, Reading, and Mathematics Placement Test Scores significantly predicted success for Enl 100 control students.

A comparison of the magnitudes of the 100-level English course grade and English, reading, and mathematics placement scores for the experimental and control groups yielded z-values of 1.07, .75, and .59--which are not significantly different. The Enl 010 and Enl 020 predictive validities were within the .40 - .60 range, and the Enl 050 correlation closely approximated the lower limit of the range. Neither the Enl 030 nor the two Enl 100 validities were of this magnitude.

Predictive Validity of the Reading Placement Test

The predictive validities for compensatory and 100-level reading courses are contained in Table XIII.

An analysis of the predictive validities in Table XIII reveals the following:

a. Both the Reading and Mathematics Placement Test Scores predict Rea 010 success.

b. The Highest Grade Completed variable predicts success in Rea 020.

c. Both the Highest Grade Completed and the Mathematics Placement Test Scores predict success in Rea 050.

d. The Highest Grade Completed is the single best predictor of Rea 101 success for both the experimental and control group students.

Although negative validity coefficients were encountered in Tables XI and XII, for the first time in Table XIII negative validity coefficients were statistically significant. A correlational or validity coefficient can range from -1.00 to .00 to +1.00. A negative correlation usually im-

TABLE XIII

PREDICTIVE VALIDITIES OF SELECTED VARIABLES AND SUCCESS IN COMPENSATORY AND 100-LEVEL READING COURSES

Group	Course	Highest Grade Completed	Years Since High School Graduation	English Placement Score	Reading Placement Score	Mathematics Placement Score
Experimental (Students with Compensatory Reading Courses)	Rea 010	.000 (7)	-.571 (7)	-.596 (7)	-.793* (7)	.875** (7)
	Rea 020	.655* (9)	.234 (7)	.073 (8)	.496 (8)	-.351 (7)
	Rea 050	.480** (29)	-.132 (28)	-.090 (29)	-.062 (29)	.408* (23)
	Rea 101	.285* (33)	-.364 (32)	.000 (53)	.043 (33)	.287 (27)
Control (No compensatory courses)	Rea 101	-.677** (13)	.290 (12)	.000 (10)	.203 (13)	.000 (11)

Values in parentheses represent the number of pairs of scores compared.
*p=.05; **p=.01

plies an inverse relationship between the measures compared. For example, a high score on Test A predicts a low score on Test B. On the other hand, positive correlations or validity coefficients tend to indicate a direct relationship.

The reader should keep in mind that the RC score on the SRA Diagnostic Reading Test is used to place people in reading courses. Students scoring lowest on the RC scale are assigned to Rea 010. It is not unexpected, therefore, that the validity coefficient between the Reading Placement Score and Rea 010 would have a negative algebraic sign, since students with high RC scores would not be placed in Rea 010.

Along this same line, the -.177 validity coefficient between Highest Grade Completed and Rea 101 success for control group students also is interesting. For these 13 students, what this coefficient seems to be saying is that students with more formal education tended to under-achieve, whereas their less formally educated peers tended to try harder and over-achieve.

The significance of the difference in validity coefficients for the Highest Grade Completed and Rea 101 success for experimental and control group students produced a z-value of 3.06, which is statistically significant beyond the .01 level of confidence. Therefore, the -.677 coefficient for control group students is significantly superior to the .285 coefficient for experimental group students. For the experimental group students, the Rea 010, Rea 020, and Rea 050 validity coefficients fall within, or exceed, the .40 - .60 range usually found with effective predictive validity. For the control group, the Rea 101 coefficient similarly exceeds this range.

Are Remedial-Compensatory Courses Effective at EPCC?

The major portion of the study sought to find the answer to the topical question for this part of the report. A 10% sample of students for the spring terms of academic years 1972-73, 1973-74, and 1974-75 were randomly selected by Social Security numbers. The resulting sample size was 1410.

The raw data across 19 variables in the major study for students who had taken the placement tests and those who did not are contained in Table XIV.

Analysis of the data in Table XIV reveals the following:

a. Non-placement score students had more formal education and higher GPA's than their placement score peers.

b. Non-placement score students achieved higher mean score in Enl 020 than placement score students.

c. For the placement score students, one or more Skills classes were completed for 46.46% in mathematics, 25.46% in English, and 31.39% in reading.

d. For the non-placement score students, one or more Skills classes were completed for 17.60% in mathematics, 7.30% in English, and 10.11% in reading.

e. There was no significantly different level of achievement in 100-level courses in mathematics, English, or reading.

The no significant difference finding for the three 100-level courses was of particular interest. For the placement-score sample, some students' placement scores indicated a need for compensatory courses, while other did not. An ancillary analysis of these data was performed, and the results are contained below Table XIV.

For the mathematics and English 100-level courses, the mean score for

TABLE XIV

MEANS, STANDARD DEVIATIONS, AND t TEST DATA ON 19 VARIABLES
FOR 876 STUDENTS WITH AND 537 STUDENTS WITHOUT SELECTION SCORES

	876 STUDENTS WITH SELECTION SCORES			534 STUDENTS WITHOUT SELECTION SCORES			GROUP COMPARISONS		
	N	MEAN	STD DV	N	MEAN	STD DV	t	df	p.
1. HIGHEST GRADE COMPLETED	827	12.00	.77	523	12.47	1.30	-7.53	1348	<.001
2. EPCC GPA	646	3.09	.54	427	3.17	.61	-2.22	1071	<.05
3. YRS SINCE HS GRADUATION	760	12.05	10.78	490	12.32	10.94	-0.27	1248	N.S.
4. ENL SELECTION SCORES	826	3.05	.82	0	--	--	N.C.	--	--
5. REA SELECTION SCORE	822	172.37	78.53	0	--	--	N.C.	--	--
6. MAT SELECTION SCORE	815	12.00	7.77	0	--	--	N.C.	--	--
7. Mat 010	201	89.13	7.24	42	90.48	6.33	-1.22	241	N.S.
8. Mat 020	162	87.35	8.53	41	88.41	7.94	-0.82	201	N.S.
9. Mat 030	44	87.05	8.51	11	88.64	8.09	-.58	53	N.S.
10. Mat 100	191	84.84	9.37	98	84.80	9.63	.03	287	N.S.
11. Enl 010	34	85.09	15.69	11	89.55	8.20	-1.22	43	N.S.
12. Enl 020	76	83.14	12.13	9	89.44	8.82	-2.80	83	< .01
13. Enl 050	113	86.37	7.39	19	88.16	5.82	-1.19	131	N.S.
14. Enl 100	309	86.46	8.27	117	85.28	10.76	1.07	424	N.S.
15. Rea 010	45	86.42	14.21	12	86.25	13.84	.04	55	N.S.
16. Rea 020	115	90.61	7.61	19	83.68	7.61	1.02	134	N.S.
17. Rea 050	115	90.48	6.52	23	89.78	5.93	.51	137	N.S.
18. Rea 101	50	92.60	4.76	14	92.14	6.11	.26	62	N.S.
19. Enl 030	80	86.68	11.93	27	89.07	7.47	-1.22	105	N.S.

100-Level Course Success For Three Groups Of Entering EPCC Students (N=1410)

Course \ Data	876 Students With Placement Scores						534 Students Without Placement Scores			Group Comparison					
	A. With Comp. Courses			B. W/O Comp. Courses			C.			A/B		A/C		B/C	
	N	Course Mean	Std Dev	N	Mean	Std Dev	N	Mean	Std Dev	t	df	t	df	t	df
Mat 100	100	83.75	9.57	91	86.10	9.13	98	84.80	9.63	-1.73	189	-.77	196	.95	187
Enl 100	91	85.00	8.31	218	87.29	7.82	117	85.28	10.76	-2.25*	307	-.21	206	1.78	333
Rea 101	33	91.97	5.29	17	94.23	2.77	14	92.14	6.11	-1.98*	48	-.09	45	1.18	29

* p = .05

each group was a B grade. The significant difference in the mean scores for the two placement score groups, while statistically significant, is of little practical consequence. The 191 count for the compensatory students who were successful in Mat and English 100, can attribute their success and future success in collegiate courses at EPCC to those available compensatory courses. Similarly, all three reading groups averaged at the "A" grade level. The same interpretation for the statistical significance pertains to the 33 compensatory students who were successful in Rea 101.

The average GPA for the compensatory students across the three 100-level courses was 3.09. This is identical to the GPA attained by the placement score students who could be assigned directly into the 100-level courses, and significantly less than the 3.17 GPA achieved by non-placement score students. The practical significance of this finding is not qualitative from a practical point of view.

Since the Table XIV data do not reflect real statistical differences between the two groups after EPCC studies were undertaken, the two groups were combined into a 1410 student sample for subsequent analyses. The correlational matrices for each of the two groups are contained in Appendix B.

Differences by Age of Entering EPCC Students

The deck of 1,410 cards was sorted according to age, and each of the eight age groups was run through the computer to compute means and standard deviations for each of the 19 variables. These data are presented in Table XV.

It is inappropriate statistically to run t tests across the eight groups and their various combinations. Since the N size within each group varied considerably because of missing data, the interpretation of the data in Table XV will be based upon observation rather than statistical analysis.

TABLE XV

MEANS AND STANDARD DEVIATIONS OF 1410 ENTERING EPCC STUDENTS ACCORDING TO EIGHT AGE GROUPINGS

RAW DATA / VARIABLES	AGE 20 (N=306)			AGE 21-25 (N=360)			AGE 26-30 (N=235)			AGE 31-35 (N=122)			AGE 36-40 (N=122)			AGE 41-45 (N=124)			AGE 46-50(N=64)			AGE 51+(N=77)		
	N	MEAN	STD DEV	N	MEAN	STD DEV	N	MEAN	STD DEV	N	MEAN	STD DEV	N	MEAN	STD DEV	N	MEAN	STD DEV	N	MEAN	STD DEV	N	MEAN	STD DEV
1. HIGHEST GRD. COMPLETED	285	11.92	.77	351	12.28	.99	228	12.24	1.11	113	12.20	1.39	116	12.16	.98	120	12.18	.89	63	12.19	1.41	74	12.39	1.13
2. EPCC GPA	232	3.02	.59	279	3.12	.56	177	3.12	.58	93	3.22	.56	96	3.18	.55	94	3.18	.51	44	3.23	.56	58	3.09	.59
3. YRS. SINCE HS GRAD.	167	2.54	5.89	340	5.34	5.33	231	9.22	2.64	120	14.71	10.10	120	20.38	8.96	122	21.16	6.20	64	33.36	8.69	77	24.08	9.08
4. Enl SELECTION SCORE	202	3.08	.76	196	3.15	.78	136	3.05	.81	57	2.68	.93	82	2.89	.88	76	3.01	.77	40	3.28	.75	44	3.02	.9
5. REA SELCTION SCORE	193	178.07	77.65	194	191.42	75.84	138	175.70	82.28	60	149.08	87.05	79	157.80	7[illegible].20	80	152.28	67.22	43	170.86	82.95	41	148.78	70.90
6. MAT SELCTION SCORE	195	11.95	7.35	189	13.77	10.25	140	12.22	7.69	60	12.18	7.05	76	10.39	5.44	77	10.05	5.03	40	11.68	6.95	44	11.09	5.63
7. MAT 010	31	88.23	6.53	44	90.23	6.64	44	89.77	7.31	18	91.11	5.02	29	89.83	6.88	49	89.29	7.64	13	85.77	9.54	15	88.33	7.24
8. MAT 020	38	88.95	8.23	47	87.13	9.07	42	88.57	7.91	14	85.00	8.77	17	87.94	8.49	28	86.07	8.32	8	87.50	10.35	9	87.22	6.67
9. MAT 030	10	87.00	7.89	12	85.83	9.00	14	87.86	8.25	5	85.00	10.00	7	93.57	3.78	1	95.00	.00	3	81.67	11.55	3	85.00	10.0
10. MAT 100	48	84.58	9.67	72	86.94	8.33	46	84.35	9.29	28	84.64	11.38	33	85.30	10.15	35	81.29	8.08	12	89.17	9.00	15	81.00	9.8
11. ENL 010	1	95.00	.00	5	89.00	8.94	8	83.75	9.91	6	90.00	8.37	3	85.00	10.00	15	83.87	22.22	4	90.00	5.77	3	85.00	.00
12. ENL 020	9	88.33	7.07	12	86.67	9.37	20	85.00	7.95	10	72.40	22.82	11	84.09	8.31	14	85.36	11.84	5	83.00	8.37	4	82.50	9.57
13. ENL 050	31	86.29	7.18	19	86.05	6.58	20	86.00	6.41	11	81.82	11.40	12	89.17	5.15	27	87.22	6.41	5	93.00	4.47	7	87.86	9.56
14. ENL 100	109	84.43	9.39	107	86.96	7.82	66	88.64	6.71	32	87.81	6.83	33	85.91	8.43	47	83.57	13.46	15	88.33	7.24	21	84.52	9.73
15. REA 010	1	95.00	.00	6	70.67	31.12	16	88.75	8.85	7	90.71	5.35	7	82.14	7.56	12	87.92	12.87	3	81.67	11.55	5	95.00	.00
16. REA 020	24	91.25	6.47	20	87.75	11.64	22	90.00	6.73	13	90.38	5.60	15	91.00	6.32	24	92.08	5.50	5	93.00	4.47	11	87.73	10.09
17. REA 050	18	88.89	6.08	26	90.38	7.06	17	89.12	7.12	14	92.14	5.11	16	94.38	2.50	28	90.00	5.77	8	87.50	7.07	11	89.55	8.20
18. REA 101	8	92.50	7.07	12	94.17	2.89	13	93.46	3.76	4	87.50	5.00	4	95.00	.00	13	91.15	5.06	4	92.50	5.00	6	91.67	8.17
19. ENL 030	7	86.43	6.90	18	88.33	8.40	20	90.50	6.05	8	88.75	7.44	14	88.57	5.33	22	82.91	18.23	7	80.71	12.72	11	90.45	8.20

The following observations, with respect to age, seem appropriate:

a. Students from 21-35 and those over 51 entered EPCC with more formal education than students in other age groups.

b. Students from 31-50 earn higher EPCC grade point averages than students of other age groups.

c. For some reason, students 46-50 have more years of education since high school graduation than their over 51 year old peers. It could be that more students over 51 had completed their GED equivalency later in life.

d. Students from 21-25 and 46-50 attained higher English Placement Test Scores.

e. Students less than 20 through 30 made the highest scores on the Reading Placement Test.

f. Students from 21-35 achieved higher Mathematics Placement Test Scores.

g. Students from 26-30, and 36-45 required more compensatory mathematics courses.

h. More students from 31-45 completed 100-level mathematics courses.

i. More students 36 and older required compensatory English courses.

j. More students from less than 20 through 25 and those 41-45 completed 100-level English courses.

k. More students 36-45 and over 51 were enrolled in Skills reading courses.

l. More students 41-45 and over 51 successfully completed the 100-level reading courses.

With respect to age, it is interesting to note that although the highest Mathematics Placement Test Scores were made by students 21-35,

42.55% of students 26-30 took Skills mathematics courses. Similarly, although more students 46-50 achieved higher English Placement Test Scores, 32.81% of the same group also were enrolled in Skills English courses. Finally, although students less than age 30 tended to make higher RC scores on the Reading Placement Test, 23.40% of 26-30 students enrolled in Skills reading courses.

Differences by Sex of Entering EPCC Students

The data were sorted by the sex of the entering EPCC student. (Thirteen cards were chewed up by the sorting machine, so these data are not available in subsequent analysis.) Data across the 19 variables based on sex are contained in Table XVI.

Analysis of the data in Table XVI suggests the following:

a. EPCC women students significantly outscore their male counterparts with respect to: Highest Grade Completed, EPCC Grade Point Average earned, English Placement Test Score, Reading Placement Test Score, Mat 100, and Enl 100.

b. The following percentage of women completed the compensatory courses: 28.64% in mathematics,11.51% in English, and 19.69% in reading.

c. The following percentage of men completed compensatory courses 38.37% in mathematics, 21.57% in English, and 24.95% in reading.

d. For women students the following percentage successfully completed 100-level courses: 13.30% in mathematics, 37.34% in English, and 4.09% in reading.

e. For men students the following percentage successfully completed 100-level courses: 23.26% in mathematics, 27.53% in English, and 4.77% in reading.

TABLE XVI

MEANS, STANDARD DEVIATIONS, AND GROUP COMPARISONS
OF 1397 EPCC ENTERING STUDENTS BASED UPON SEX

	Females (N=391)			Males (N=1006)			t	df	p.
	N	Mean	Std Dv	N	Mean	Std Dv			
1. HIGHEST GRADE COMPLETED	376	12.30	1.24	963	12.13	.95	2.40	1337	<.05
2. EPCC GPA	306	3.22	.58	757	3.09	.56	3.36	1061	<.001
3. YRS SINCE HS GRADUATION	323	12.55	11.94	915	11.87	10.04	0.92	1236	N.S.
4. Enl Placement SCORE	236	3.31	.72	590	2.94	.83	6.35	824	<.001
5. Rea Placement SCORE	228	186.53	80.78	594	166.90	76.92	3.16	820	<.01
6. Mat Placement SCORE	226	12.10	8.70	589	11.95	7.21	.23	813	N.S.
7. Mat 010	65	89.62	6.14	178	89.27	7.42	.37	241	N.S.
8. Mat 020	36	88.06	8.56	165	87.36	8.40	.45	199	N.S.
9. Mat 030	11	89.55	8.20	43	86.63	8.43	1.05	52	N.S.
10. Mat 100	52	87.50	8.13	234	84.32	9.56	2.47	284	<.05
11. Enl 010	2	90.00	7.07	43	86.00	14.55	.73	43	N.S.
12. Enl 020	12	85.00	7.39	73	83.62	12.56	.53	83	N.S.
13. Enl 050	31	87.90	7.39	101	86.24	7.12	1.10	130	N.S.
14. Enl 100	146	87.33	8.31	277	85.52	9.34	2.04	421	<.05
15. Rea 010	8	90.00	7.56	48	86.02	14.84	1.16	54	N.S.
16. Rea 020	34	92.06	5.79	100	89.75	8.08	1.80	132	N.S.
17. Rea 050	35	89.29	6.98	103	90.73	6.20	1.08	136	N.S.
18. Rea 101	16	93.13	5.44	48	92.29	4.94	.55	62	N.S.
19. Enl 030	20	86.00	7.88	87	87.57	11.61	.20	105	N.S.

With the exception of Rea 050 and Enl 030, every mean score in Table XVI suggests higher achievement by EPCC women.

Differences by Academic Component

Although the cards were sorted by sex, they were additionally sorted within sex by academic component and run through the computer. Then the sexes were combined to yield data by academic component only. All of these data are presented in Table XVII.

Analysis of the data in Table XVII reveals the following:

a. In General Studies, except for Mat 010, Mat 020, Rea 020, Rea 050, and Enl 030, women student scores were superior to those made by men.

b. In Occupational Studies, except for the Mathematics Placement Test Score, Rea 050, Rea 101, and Enl 030 women student scores were superior to those made by men.

c. Occupational Studies students had significantly more years elapse since high school graduation and enrollment at EPCC than did General Studies students.

d. General Studies students had significantly higher Reading Placement Test Scores than did Occupational Studies students.

e. Occupational Studies students scored higher in their departmental 100-level English courses than General Studies students.

f. All other comparisons are not statistically different by academic components.

It appears that across the two academic components, the compensatory courses in English and mathematics have assisted students in preparing for and successfully completing 100-level English and mathematics courses. To test the validity of this observation, the data were sorted by academic

TABLE XVII

MEANS AND STANDARD DEVIATIONS OF 1967 FEMALE AND MALE STUDENTS ENROLLED IN GENERAL AND OCCUPATIONAL STUDIES AT LPCC AS WELL AS TOTALS / 10 GROUP COMPARISON BY ACADEMIC COMPONENT

VARIABLES	GENERAL STUDIES (N=295)						OCCUPATIONAL STUDIES (N=1102)						TOTAL						GS OS COMPARISON		
	FEMALES (N=114)			MALES (N=181)			FEMALES (N=277)			MALES (N=825)			GENERAL STUDIES (N=295)			OCCUPATIONAL STUDIES (N=1102)			t	df	p
HIGHEST GRDE	N	X	S	N	X	S	N	X	S	N	X	S	N	X	S	N	X	S			
1. COMPLETED	112	12.24	1.17	176	12.14	.90	264	12.33	1.27	787	12.13	.96	288	12.17	1.02	1051	12.19	1.05	0.15	1137	N.S.
2. EPCC GPA	98	3.24	.60	141	3.08	.62	206	3.20	.58	618	3.00	.57	239	3.15	.56	824	3.12	.57	0.73	1061	N.S.
YRS. SINCE HS 3. GRADUATION	93	12.19	11.91	154	9.17	8.53	230	12.69	11.98	761	12.42	10.23	247	10.31	10.05	991	12.48	10.66	3.00	1236	.01
ENL SELECTION 4. SCORE	76	330	.75	106	3.02	.73	160	3.32	.71	485	2.92	.85	181	3.14	.75	645	3.02	.83	1.85	826	N.S.
REA SELECTION 5. SCORE	70	184.23	92.12	106	184.22	81.24	158	182.67	72.21	489	163.18	75.53	175	188.62	85.67	647	167.94	75.86	2.90	820	.01
MAT SELECTION 6. SCORE	71	13.03	11.40	101	11.78	6.88	155	11.68	7.13	488	11.09	7.28	172	12.30	9.02	643	10.91	7.24	1.87	813	N.S.
7. MAT 010	25	88.60	6.38	32	90.31	6.71	40	90.25	5.99	146	89.04	7.16	57	89.56	6.29	186	89.30	7.34	0.26	241	N.S.
8. MAT 020	19	87.11	9.76	39	87.31	9.10	17	89.12	7.12	126	87.35	8.53	58	87.24	8.59	143	87.59	8.37	0.26	199	N.S.
9. MAT 030	7	86.43	9.50	16	85.63	8.54	4	95.00	.00	27	87.22	8.47	23	85.87	8.68	31	88.23	8.32	1.02	52	N.S.
10. MAT 100	11	89.55	8.20	32	84.38	8.78	41	86.95	8.13	202	84.31	9.70	43	85.70	8.84	243	84.75	9.49	0.64	284	N.S.
11. ENL 010	2	90.00	7.07	4	68.25	41.26	0	--	--	39	87.82	7.93	6	75.50	34.02	39	87.82	7.93	.88	43	N.S.
12. ENL 020	8	85.00	7.56	18	81.06	20.75	4	86.00	8.17	55	84.45	8.48	26	82.27	17.67	59	84.49	8.39	0.61	83	N.S.
13. ENL 050	18	88.33	7.67	31	87.10	8.73	13	87.31	7.25	70	85.86	6.31	49	87.55	8.30	83	86.08	6.44	1.07	130	N.S.
14. ENL 100	51	86.37	9.39	60	82.55	12.43	95	87.84	7.67	217	86.34	8.14	111	84.31	11.23	312	86.79	8.02	2.14	421	.05
15. REA 010	2	85.00	14.14	5	80.00	18.71	6	91.67	5.16	43	86.72	14.43	7	81.43	16.51	49	87.33	13.70	0.90	54	N.S.
16. REA 020	12	90.83	6.69	20	92.00	4.70	22	92.73	5.28	80	89.10	8.66	32	91.56	5.45	102	89.95	8.16	1.28	132	N.S.
17. REA 050	15	88.33	7.24	22	90.45	6.71	20	90.00	6.88	81	90.80	6.10	37	89.59	6.91	101	90.64	6.23	0.81	136	N.S.
18. REA 101	6	95.00	.00	15	92.33	4.58	10	92.00	6.75	33	92.27	5.17	21	93.10	4.02	43	92.21	5.49	0.73	62	N.S.
19. ENL 030	6	85.00	10.95	22	89.55	8.00	14	86.43	6.63	65	86.91	12.59	28	88.57	8.70	79	86.82	11.72	0.83	105	N.S.

department and separately run through the computer. These data are presented in Appendix C.

For the General Studies academic component:

a. The mean Mat 100 course averages are equivalent.

b. Except for the 36 Skills Studies majors,* the Enl 100 course averages are equivalent.

c. All departmental Rea 101 course averages are nearly equal.

In examining the three placement test scores across the nine academic departments, the Reading Placement Test Score showed the most variability. A department-by-department profile by Reading Placement Test Score is depicted in Table XVIII.

In Table XVIII the national percentile norm values for RC scores are presented on the left side of the line under the Business & Office Departmental listing, and the locally-derived EPCC norms from the reliability portion of this study are presented in parentheses on the right side.

According to national entering collegiate freshman norms, every EPCC departmental RC average was below the 50th percentile.

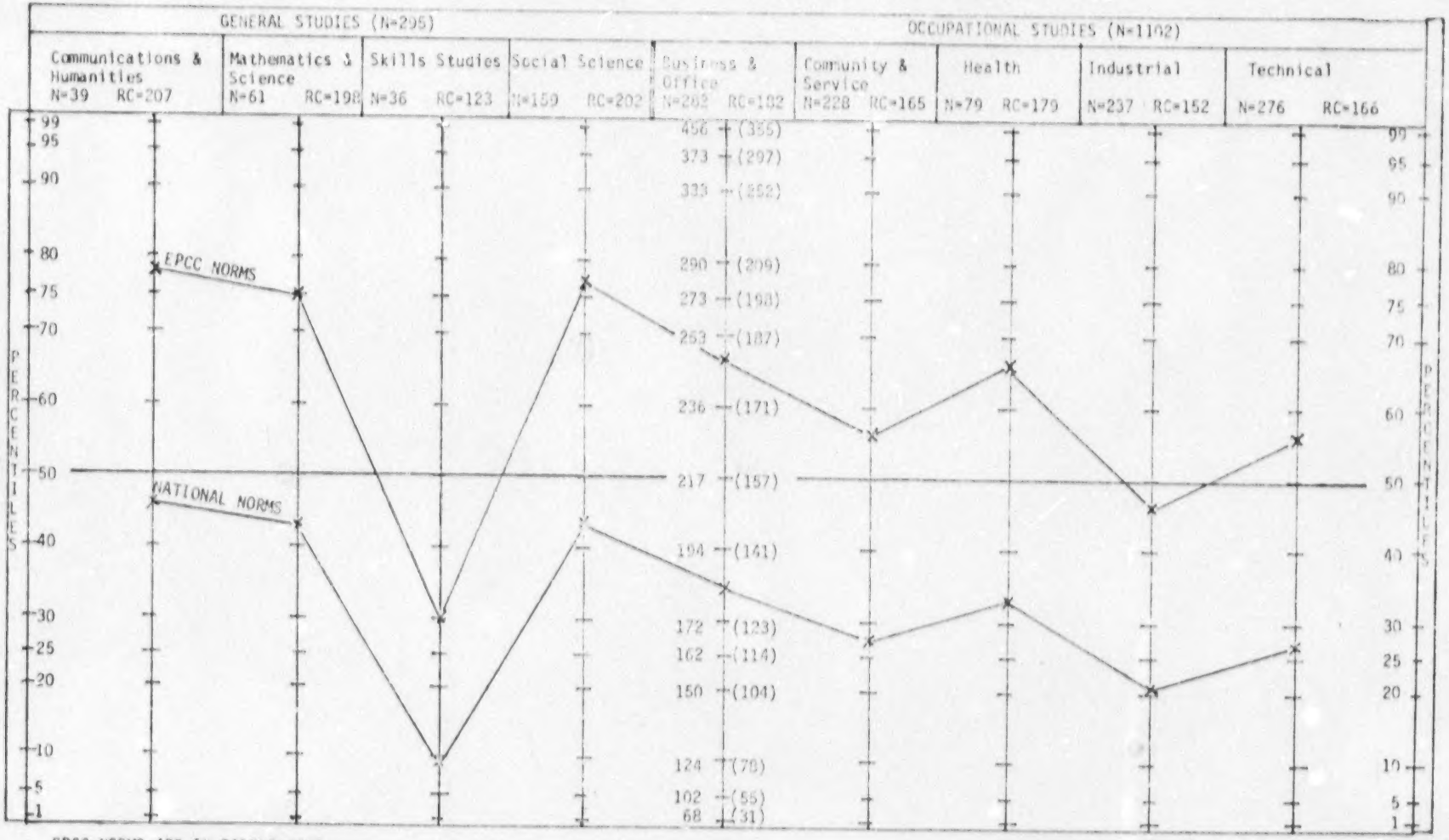
From a local norms standpoint, except for the Skills Studies and Industrial Occupations Departments, all other EPCC departments have RC averages above the 50th percentile.

For a community college operating under an open door admission policy, the above norm findings are to be expected. The nature of the goals of the various departments in a community college tends to be such that students with an average reading ability can be successful in their respec-

*This is a convenience classification for students carrying 12 or more credit hours in Skills courses in any one quarter.

TABLE XVIII

DEPARTMENTAL PROFILE BY READING SELECTION SCORES MADE BY 1397 ENTERING EPCC STUDENTS



EPCC NORMS ARE IN PARENTHESES.

tive post graduation occupations. The Skills Studies Department has demonstrated that it can take entering students with low achievement in English, mathematics, and reading and prepare them to be competitive in 100-level mathematics and English courses throughout the other eight academic departments at EPCC.

Differences by Ethnic Characteristics

A final sorting was made in the major portion of the study to determine if the scores made by students from five ethnic groups were different from the scores of other students. After the sorting, a count of students from each ethnic group was compared with El Paso County proportionate ethnic population to see if the ethnic sample enrollment at EPCC was different from the proportionate distribution in El Paso County. These data are contained in Table XIX.

TABLE XIX

CHI SQUARE ANALYSIS OF SAMPLE EPCC STUDENTS WITH EL PASO COUNTY ETHNIC DISTRIBUTION

ETHNIC GROUP	NATIVE AMERICAN	BLACK	ORIENTAL	SPANISH SURNAMED	OTHER	TOTAL
EPCC SAMPLE	14	106	8	93	1176	1397
EXPECTED EL PASO COUNTY DATA	2	87	16	136	1156	1397

df = 4 $\quad x^2 = 94.091^{***}$

*p. 05 = 9.49; **p. 01 = 13.28; ***p. 001 = 18.46

Although the Chi Square value of 94.091 obtained in Table XIX is highly significant, the reason for this significance is that the minority students in the sample have redistributed themselves proportionately. In fact, when a Chi Square analysis of minority and other students is com-

puted, the resulting Chi Square of 2.006 is not statistically significant (p.05=3.84). In the Table XIX analysis,it can be seen that significantly more Native Americans and Blacks were in the sample, and that there are significantly fewer Oriental and Spanish Surnamed than are contained in the El Paso County ethnic distribution.

The data for the 19 variables across five ethnic groups are contained in Table XX. The statistical analysis of these data is contained in Table XXI.

Analysis of the findings in Table XXI suggests the following:

a. With respects to Highest Grade Completed, students classified as Other, which includes all those ethnic groups other than those listed, had more formal education than Black or Spanish Surnamed students.

b. Other students achieved significantly higher grade point averages at EPCC than Black or Spanish Surnamed students.

c. Black students recorded more Years Since High School Graduation (or GED) than did Spanish Surnamed or Other students.

d. Other students achieved higher on their English Placement Test Score than Native Americans, Blacks, and Spanish Surnamed students. Spanish Surnamed students scored significantly higher English Placement Test Scores than Native Americans or Black students.

e. Other students scored higher on their Reading Placement Test Scores than Black or Spanish Surnamed students. Spanish Surnamed students scored higher on Reading Placement Test Scores than Black students.

f. Other students scored higher on their Mathematics Placement Test Score than Native American, Black, or Spanish Surnamed students.

g. In Mat 020 courses, Other students scored higher grades than Black

TABLE XX

RAW DATA ON 1397 STUDENTS IN THE EPCC SAMPLE CATEGORIZED BY ETHNIC CHARACTERISTICS

	ETHNIC BACKGROUND OF EPCC STUDENTS														
	Native American (N=14)			Black (N=106)			Oriental (N=8)			Spanish Surnamed (n=93)			Other (N=1176)		
	N	MEAN	ST DEV	N	MEAN	ST DEV	N	MEAN	ST DEV	N	MEAN	ST DEV	N	MEAN	ST DEV
1. Highest Grde Completed	12	12.00	.74	97	11.98	.68	8	12.25	1.17	84	11.76	.93	1138	12.23	1.08
2. EPCC GPA	13	3.09	.60	78	2.83	.84	6	3.07	.54	73	2.92	.56	893	3.17	.55
Yrs since HS 3. Graduation	14	12.71	10.62	98	15.31	10.57	5	10.60	14.74	89	11.20	10.03	1032	11.81	10.56
Enl Selection 4. Score	5	2.20	.45	71	2.31	.82	6	2.67	1.03	62	2.76	.74	682	3.16	.77
Rea Selection 5. Score	6	167.50	158.95	71	116.83	66.78	6	145.83	84.44	59	139.12	60.03	680	18.30	77.01
Mat Selection 6. Score	7	7.71	5.38	72	9.31	5.70	6	11.67	5.47	59	9.05	6.80	671	12.59	7.81
7. Mat 010	4	90.00	5.77	25	87.40	7.23	1	95.00	.00	21	88.81	6.69	192	89.64	7.15
8. Mat 020	4	87.50	9.57	18	82.78	8.08	2	85.00	14.14	16	82.50	7.75	161	88.54	8.17
9. Mat 030	0	--	--	3	88.33	11.55	0	--	--	2	80.00	7.07	49	87.45	8.30
10. Mat 100	4	85.00	8.17	13	78.08	9.47	1	85.00	.00	10	78.16	8.20	249	85.76	9.19
11. Enl 010	0	--	--	9	86.11	6.01	0	--	--	8	88.75	9.16	28	85.46	17.24
12. Enl 020	1	75.00	.00	16	84.38	6.80	1	95.00	.00	13	85.77	8.62	54	83.13	13.31
13. Enl 050	1	85.00	.00	15	87.67	5.04	2	80.00	7.07	12	86.67	5.77	102	86.62	7.55
14. Enl 100	5	81.00	13.42	32	81.66	15.73	3	75.00	10.00	21	85.00	9.49	362	86.77	7.92
15. Rea 010	0	--	--	12	78.75	10.25	0	--	--	10	79.40	26.38	34	91.47	6.46
16. Rea 020	4	92.50	5.00	19	89.74	9.05	1	95.00	.00	16	85.94	11.86	94	91.06	6.25
17. Rea 050	1	95.00	.00	17	88.53	7.86	0	--	--	14	92.14	6.11	106	90.38	6.20
18. Rea 101	1	95.00	.00	4	95.00	.00	0	--	--	5	93.00	4.47	54	92.22	5.29
19. Enl 030	0	--	--	12	83.33	9.37	0	--	--	17	89.12	6.18	78	87.49	11.95

TABLE XXI

STATISTICAL ANALYSIS OF EPCC SAMPLE GROUPED BY ETHNIC CHARACTERISTICS

	GROUP MEAN COMPARISONS BY ETHNIC CHARACTERISTICS OF ENTERING EPCC STUDENTS																			
	NA/BL		NA/ORI		NA/SS		NA/OTH		BL/ORI		BL/SS		BL/OTH		ORI/SS		ORI/OTH		SS/OTH	
	t	df	t	df	t	df	t	df	t	df	t	df	t	df	t	df	t	df	t	df
Highest Grde Completed	.09	107	-.54	18	1.02	94	-1.07	1148	-.65	103	1.95	179	-4.29***	1233	1.15	90	.05	1144	-4.42***	1220
2. EPCC GPA	1.43	89	.07	17	.95	84	-.33	904	-1.03	82	-.62	149	-4.55***	969	.65	77	-.45	897	-.551***	964
Yrs Since HS 3. Graduation	-.86	110	.29	17	.50	101	.32	1044	.71	101	2.73**	185	2.34*	1128	-.09	92	-.18	1035	-.41	1119
Enl Selection 4. Score	-.49	74	-1.01	9	-2.52*	65	-4.72***	685	-.63	75	-3.33***	131	-8.33***	751	-.21	66	-1.16	686	-4.06***	742
Rea Selection 5. Score	.78	75	.29	10	.45	63	-.21	634	-.82	75	-3.07**	128	-7.62***	749	.19	63	-1.03	684	-5.05***	737
Mat Selection 6. Score	-1.60	77	-1.31	11	-.60	64	-2.37*	676	-1.01	75	.23	129	-4.45***	741	.80	63	-.41	675	-3.76***	728
7. Mat 010	.81	27	N.C.	--	.37	23	.12	194	N.C.	--	.69	44	-1.46	215	N.C.	--	N.C.	--	-.54	211
8. Mat 020	.92	20	.23	4	.97	18	-.22	163	-.22	18	.10	32	-2.87**	177	.25	16	-.35	161	-2.96**	175
9. Mat 030	N.C.	--	N.C.	--	N.C.	--	N.C.	--	N.C.	--	1.00	3	.13	50	N.C.	--	N.C.	--	-1.45	49
10. Mat 100	1.42	15	N.C.	--	1.52	21	-.18	251	N.C.	--	-.02	30	-2.86**	260	N.C.	--	N.C.	--	-3.86***	266
11. Enl 010	N.C.	--	N.C.	--	N.C.	--	N.C.	--	N.C.	--	-.69	15	.17	35	N.C.	--	N.C.	--	.72	34
12. Enl 020	N.C.	--	N.C.	--	N.C.	--	N.C.	--	N.C.	--	-.47	27	.40	68	N.C.	--	N.C.	--	.87	65
13. Enl 050	N.C.	--	N.C.	--	N.C.	--	N.C.	--	1.47	15	.44	25	.61	115	-1.27	12	-1.31	102	.03	112
14. Enl 100	-.10	35	.72	6	-.53	24	-.06	365	1.04	33	-.96	61	-1.62	392	-1.63	22	-2.03*	363	-.84	381
15. Rea 010	N.C.	--	N.C.	--	N.C.	--	N.C.	--	N.C.	--	-.07	20	-4.02***	44	N.C.	--	N.C.	--	-1.43	42
16. Rea 020	.84	21	N.C.	--	1.69	18	.56	96	N.C.	--	1.05	33	-.61	111	N.C.	--	N.C.	--	-1.69	108
17. Rea 050	N.C.	--	N.C.	--	N.C.	--	N.C.	--	N.C.	--	-1.44	29	-.93	121	N.C.	--	N.C.	--	-1.06	118
18. Rea 101	N.C.	--	N.C.	--	N.C.	--	N.C.	--	N.C.	--	N.C.	--	N.C.	--	N.C.	--	N.C.	--	.37	57
19. Enl 030	N.C.	--	N.C.	--	N.C.	--	N.C.	--	N.C.	--	-1.87	27	-1.38	88	N.C.	--	N.C.	--	.81	.93

NA = Native Americans; BL = Blacks; ORI = Orientals; SS = Spanish Surnamed; OTH = Other
* = p .05; ** = p .01; *** = p .001 N.C. = Not computed because the Std Dev or N for a group was zero.
The algebraic sign of t when positive indicates that the group before the diagonal (/) was higher, and when negative indicates that the group after the diagonal (/) was higher.

and Spanish Surnamed students. No additional statistical differences were found in Skills mathematics courses.

h. In Mat 100 courses, Other students scored significantly higher than Black or Spanish Surnamed students.

i. There were no statistically significant differences across ethnic groups in the compensatory English courses.

j. In the 100-level English courses, Other students scored significantly higher than Oriental students. No other comparisons of the 100-level English course grades were statistically significant.

k. In Rea 010, Other students scored significantly higher than Black students. No other comparisons in the reading compensatory courses were statistically significant.

l. There is no statistically significant difference in achievement across ethnic groups for the Rea 101 courses.

It is interesting to note that the significant differences found among ethnic groups for the first six variables which typify real differences in entering EPCC student background and skill level tend to disappear after these less skillful students have completed compensatory courses.

Other Demographic Data

Four additional sorts were made for type of student, employment status, financial status, and residency. It was felt that these final four analyses would provide a more dynamic view of the student sample across the nineteen variables.

Type of Student

The raw data on the EPCC student sample by type of student are contained in Table XXII.

Analysis of the data in Table XXII reveals the following:

TABLE XXII

RAW DATA ON NINETEEN VARIABLES FOR EPCC SAMPLE BY TYPE OF PUPIL

	Civilian (N=606)			Military-in-Service (N=113)			VA or VA Dependent (N=599)			GROUP COMPARISONS								
										CIV/MIL			CIV/VA			MIL/VA		
	N	MEAN	STD DV	N	MEAN	STD DEV	N	MEAN	STD DV	t	df	p.	t	df	p.	t	df	p.
Highest Grade Completed	659	12.28	1.23	112	12.1[illegible]	.77	568	12.07	.82	1.38	769	N.S.	3.55	1225	<.001	1.12	678	N.S.
2. EPCC GPA	547	3.15	.60	93	3.08	.65	423	3.10	.50	.97	638	N.S.	1.39	968	N.S.	-.28	514	N.S.
3. Yrs Since HS Graduation	548	10.71	11.23	108	8.19	5.97	562	14.02	10.21	3.37	654	<.001	-5.17	1128	<.001	-8.17	1101	<.001
4. Enl Selection Scores	384	3.18	.77	29	2.90	.77	413	2.92	.84	1.89	411	N.S.	4.59	795	<.001	-.13	440	N.S.
5. Rea Selection Score	372	181.21	78.71	29	179.45	77.09	421	164.01	77.59	.12	399	N.S.	3.09	791	<.001	1.04	448	N.S.
6. Mat Selection Score	371	12.24	8.11	29	12.72	7.44	415	11.72	7.23	-.33	398	N.S.	.94	784	N.S.	.70	442	N.S.
7. Mat 010	87	88.91	6.53	7	92.14	4.88	149	89.50	7.48	-1.64	92	N.S.	-.51	234	N.S.	1.68	154	N.S.
8. Mat 020	75	87.53	8.71	11	87.73	9.06	115	87.43	8.03	-.07	84	N.S.	.08	188	N.S.	.11	124	N.S.
9. Mat 030	21	85.00	8.94	1	85.00	.00	32	88.75	7.53	N.C.	--	--	-1.56	51	N.S.	N.C.	--	--
10. Mat 100	108	85.74	8.83	23	85.87	9.96	155	84.16	9.67	-.05	129	N.S.	.36	261	N.S.	.13	176	N.S.
11. Enl 010	5	93.00	4.47	2	95.00	.00	38	84.82	15.09	N.C.	--	--	2.59	41	<.01	N.C.	--	--
12. Enl 020	23	86.30	7.57	1	85.00	.00	61	82.95	13.24	N.C.	--	--	1.49	92	N.S.	N.C.	--	--
13. Enl 050	45	87.00	7.26	6	88.33	5.16	81	86.30	7.32	-.56	49	N.S.	.52	124	N.S.	.90	85	N.S.
14. Enl 100	211	86.23	8.53	23	86.30	7.57	189	86.02	9.74	-.04	232	N.S.	.23	398	N.S.	.16	210	N.S.
15. Rea 010	13	89.62	7.76	0	--	--	43	85.67	15.42	N.C.	--	--	1.24	54	N.S.	N.C.	--	--
16. Rea 020	49	91.73	5.55	4	87.50	9.57	81	89.63	8.51	.87	51	N.S.	1.70	128	N.S.	-.44	83	N.S.
17. Rea 050	49	89.69	6.80	2	90.00	7.07	87	90.75	6.22	-.06	49	N.S.	-.90	134	N.S.	-.15	87	N.S.
18. Rea 101	25	93.00	5.00	3	95.00	.00	36	91.94	5.25	N.C.	--	--	-.80	59	N.S.	N.C.	--	--
19. Enl 030	28	87.50	8.87	3	91.67	5.77	76	87.63	11.87	-1.12	29	N.S.	.22	102	N.S.	1.29	77	N.S.

a. Civilian students had attained more formal prior education than VA students.

b. VA students had a greater time lapse since H.S. graduation and civilian or military-in-service students, but civilians also had more time lapse since H.S. graduation than military-in-service students.

c. Civilian students had higher English Placement Test Scores than VA students.

d. Civilian students had higher Reading Placement Test Scores than VA students.

e. Except for Enl 010 where civilian students outscored VA students, there are no significant differences between groups or compensatory course scores.

f. There are no significant differences among groups on 100-level mathematics, English, or Reading Placement Test Scores.

Again, the same pattern emerges. Students differ on admission criteria, but after successfully completing compensatory courses to remove deficiencies, they do not differ in achievement of 100-level course material in mathematics, English, and reading.

Employment Status at Enrollment

Raw data on the student sample categorized by employment status at the time of enrollment at EPCC are contained in Table XXIII.

An analysis of the data in Table XXIII suggests the following observations:

a. Fully employed students had more formal education than the not-employed students.

b. Part time and not-employed students scored higher on the English Placement Test Score than fully employed students.

TABLE XXIII

RAW DATA ON NINETEEN VARIABLES FOR EPCC SAMPLE BY EMPLOYMENT STATUS AT ENROLLMENT

	EMPLOYMENT STATUS AT ENROLLMENT DATE (N=1398)									GROUP COMPARISONS								
	Fully Employed (N=860)			Part-Time Employed (N=437)			Not Employed (N=101)			Full/Part Time			Full/Not			Part Time/Not		
	N	Mean	Std Dv	N	Mean	Std Dv	N	Mean	Std Dv	t	df	p.	t	df	p.	t	df	p.
1. Highest Grade Completed	830	1221	1.05	416	12.17	1.08	93	12.00	.78	.62	1244	N.S.	2.38	921	.05	1.76	507	N.S.
2. EPCC GPA	681	3.13	.57	313	3.13	.57	69	3.02	.55	.00	992	N.S.	1.57	748	N.S.	1.50	380	N.S.
3. Yrs Since HS Graduation	797	11.90	9.68	376	12.49	12.35	65	11.28	9.91	-.82	1171	N.S.	.46	860	N.S.	.87	439	N.S.
4. Enl Selection Score	467	2.97	.84	290	3.13	.78	69	3.17	.75	-2.67	755	.01	-2.03	534	.05	-.39	357	N.S.
5. Rea Selection Score	471	168.60	77.97	285	177.37	81.06	66	177.35	69.52	-1.46	754	N.S.	-.94	535	N.S.	.00	349	N.S.
6. Mat Selection Score	466	12.04	8.17	280	12.09	7.06	69	11.30	6.16	-.09	744	N.S.	.89	533	N.S.	.93	347	N.S.
7. Mat 010	151	89.30	7.53	73	89.52	6.68	19	89.21	5.07	-.22	222	N.S.	.07	168	N.S.	.22	90	N.S.
8. Mat 020	125	87.48	8.58	67	87.69	8.09	9	86.11	9.28	-.17	190	N.S.	.43	132	N.S.	.49	74	N.S.
9. Mat 030	31	86.29	8.65	20	88.00	8.01	3	91.67	5.77	-.71	49	N.S.	-1.46	32	N.S.	-.97	21	N.S.
10. Mat 100	190	84.53	9.44	80	85.88	9.30	16	84.38	9.29	-1.08	268	N.S.	.06	204	N.S.	.59	94	N.S.
11. Enl 010	29	88.10	8.06	14	81.64	22.65	2	90.00	7.07	1.04	41	N.S.	-.36	29	N.S.	-1.06	14	N.S.
12. Enl 020	55	84.82	7.98	27	81.26	17.68	2	90.00	7.07	1.00	81	N.S.	-1.01	56	N.S.	-1.45	27	N.S.
13. Enl 050	71	86.69	5.85	51	86.67	8.81	10	86.00	7.38	.01	120	N.S.	.28	79	N.S.	.25	59	N.S.
14. Enl 100	225	85.81	9.35	55	86.61	8.06	43	86.16	7.93	-.59	278	N.S.	-.26	266	N.S.	.26	96	N.S.
15. Rea 010	38	85.76	16.42	16	89.38	6.29	2	80.00	7.07	-1.17	52	N.S.	1.02	38	N.S.	1.79	16	N.S.
16. Rea 020	80	89.69	8.39	48	91.46	5.35	6	90.00	5.48	-1.35	126	N.S.	-.13	84	N.S.	.60	52	N.S.
17. Rea 050	84	90.95	6.23	42	89.29	6.68	12	90.00	6.74	1.34	124	N.S.	.46	94	N.S.	-.32	52	N.S.
18. Rea 101	34	92.65	4.96	27	92.78	4.24	3	88.33	11.55	-.11	59	N.S.	.64	35	N.S.	.66	28	N.S.
19. Enl 030	72	87.28	12.10	30	86.67	8.74	5	91.00	5.48	.29	100	N.S.	-1.31	75	N.S.	-1.48	33	N.S.

c. There is no statistically significant difference among groups on grades made in any compensatory education course.

c. There is no statistically significant difference among groups on grades made in 100-level courses in mathematics.

There does not appear to be any significant relationship between employment status at enrollment and EPCC success in either compensatory or 100-level courses, or both.

Financial Status of Entering EPCC Students

Data on the financial status of entering EPCC students are contained in Table XXIV. The five categories listed in Table XXIV exceed the comparisions usually allowed for the t-test. The t-test was computed on the ethnic data in Table XX and was reported in Table XXI. Since this analysis was ancillary to the major study, the t-test was not computed for the Table XXIV data; the analysis of the Table XXIV data was observational.

Analysis of the data in Table XXIV reveals:

a. A wide range exists across groups with respect to the Years Since H.S. Graduation variable.

b. Physically handicapped students tended to make lower English Placement Test Scores than students in the other categories.

c. Mental and emotionally disadvantaged students tended to make higher Reading Placement Test Scores than students in the other categories.

d. Students from a combination of the first three categories tended to achieve higher Mathematics Placement Test Scores.

e. There does not appear to be statistically significant differences across groups in grades in compensatory or 100-level EPCC courses.

TABLE XXIV

	FINANCIAL STATUS OF ENTERING EPCC STUDENTS FROM 1972-75 (N=1398)														
	SOCIALLY & ECONOMICALLY DISADVANTAGED (N=59)			PHYSICALLY HANDICAPPED (N=39)			MENTAL & EMOTIONAL DISADVANTAGED (N=6)			COMBINATION OF FIRST THREE CATEGORIES (N=5)			NONE OR NO RESPONSE (N=1289)		
	N	MEAN	STD DV	N	MEAN	STD DV	N	MEAN	STD DV	N	MEAN	STD DV	N	MEAN	STD DV
Highest Grde Completed	58	12.14	1.25	37	12.08	.83	6	12.67	1.63	5	12.00	.00	1233	12.18	1.03
EPCC GPA	42	3.15	.51	28	3.15	.46	4	2.92	.33	3	3.27	.78	986	3.12	.58
Yrs Since HS Graduation	56	11.00	10.19	38	16.92	10.65	6	7.50	7.50	5	9.20	15.06	1133	11.85	10.17
Enl Selection Score	35	3.06	.73	28	2.86	.85	6	3.17	.75	3	4.00	.00	754	3.02	.82
Rea Selection Score	36	182.17	69.11	29	180.24	100.48	6	186.33	87.42	3	174.67	76.63	748	170.82	78.37
Mat Selection Score	37	11.68	6.66	29	10.41	5.61	6	7.50	5.36	3	22.33	18.82	740	11.82	7.59
Mat 010	7	89.29	5.35	9	90.56	7.26	3	88.33	5.77	0	--	--	224	89.30	7.27
Mat 020	15	89.00	9.10	11	87.73	7.66	0	--	--	0	--	--	175	87.28	8.48
Mat 030	4	95.00	.00	2	85.00	14.14	0	--	--	0	--	--	48	86.52	8.42
Mat 100	10	88.00	6.75	8	83.75	9.01	0	--	--	1	95.00	.00	267	84.73	9.49
Enl 010	1	95.00	.00	2	95.00	.00	0	--	--	0	--	--	42	85.55	14.58
Enl 020	2	85.00	14.14	4	87.50	5.00	3	81.67	5.77	0	--	--	76	83.67	12.42
Enl 050	8	91.25	5.18	6	90.00	5.48	1	75.00	.00	0	--	--	107	85.21	7.33
Enl 100	27	85.37	9.40	17	84.41	8.99	1	75.00	.00	3	88.33	11.55	275	86.10	9.25
Rea 010	4	73.50	43.00	6	91.67	5.16	1	95.00	.00	0	--	--	45	86.93	9.95
Rea 020	5	84.00	10.49	10	89.00	10.75	1	95.00	.00	0	--	--	118	90.66	6.40
Rea 050	4	90.00	5.77	9	91.67	5.00	1	95.00	.00	0	--	--	124	90.61	6.39
Rea 101	6	95.00	.00	3	95.00	.00	0	--	--	0	--	--	55	92.40	4.87
Enl 030	8	90.00	5.35	9	90.56	5.27	1	85.00	.00	0	--	--	389	86.77	11.91

Observation of the data in Table XXIV reveals that EPCC enrolls students from every walk of life. Although entering differences in selection criteria might exist at enrollment, each student appears to be offered an equal educational opportunity for success at EPCC.

Residency Status

Data on the residency status of entering EPCC students are contained in Table XXV.

Analysis of the data in Table XXV suggests the following:

a. In-state students have more elapsed years between H.S. graduation and enrollment at EPCC.

b. Out-of-state students tended to make higher English, Reading, and Mathematics Placement Scores than in-state students, although these differences are not statistically significant.

c. There are no statistically significant differences in mean scores among groups for either compensatory or 100-level courses.

If anything, it appears that out-of-state students tend to bring a richer and more varied educational background to the EPCC campus than their in-state student peers.

TABLE XXV

RAW DATA AND t TEST COMPARISON OF EPCC REGISTRAR'S INFORMATION ON 1409 STUDENTS' TUITION STATUS FROM 1972-75

DATA / VARIABLES	IN STATE TUITION (N=1279)			OUT OF STATE TUITION (N=130)			GROUP COMPARISONS		
	N	MEAN	STD DEV	N	MEAN	STD DEV	t	df	p.
1. HIGHEST GRADE COMPLETED	1221	12.17	1.03	129	12.23	1.14	-0.57	1348	N.S.
2. EPCC GPA	965	3.12	.56	108	3.17	.66	-0.76	1073	N.S.
3. YEARS SINCE HS GRADUATION	1139	12.53	11.14	111	8.31	5.79	6.58	1248	<.001
4. ENL SELECTION SCORE	777	3.04	.81	56	3.09	.86	-0.42	831	N.S.
5. REA SELECTION SCORE	775	172.23	77.97	53	175.72	87.17	-0.28	826	N.S.
6. MAT SELECTION SCORE	768	12.04	7.74	53	12.21	8.69	-0.06	819	N.S.
7. Mat 010	225	89.22	7.16	18	91.11	6.08	-1.25	241	N.S.
8. Mat 020	182	87.69	8.34	21	86.43	9.10	0.59	201	N.S.
9. Mat 030	51	86.76	8.42	4	95.00	.00	N.C.	--	--
10. Mat 100	266	84.62	9.47	23	87.17	9.02	-1.27	287	N.S.
11. Enl 010	44	85.98	14.38	1	95.00	.00	N.C.	--	--
12. Enl 020	84	83.80	12.01	1	85.00	.00	N.C.	--	--
13. Enl 050	125	86.48	7.27	7	89.29	5.35	-1.33	130	N.S.
14. Enl 100	393	86.23	9.14	33	85.00	7.50	0.89	424	N.S.
15. Rea 010	57	86.39	14.01	0	--	--	N.C.	--	--
16. Rea 020	131	90.31	7.67	3	91.67	5.77	-0.40	132	N.S.
17. Rea 050	133	90.49	6.21	5	87.00	10.95	0.71	136	N.S.
18. Rea 101	61	92.38	5.13	3	95.00	.00	N.C.	--	--
19. Enl 030	102	87.10	11.18	5	91.00	5.48	-1.45	105	N.S.

N.S. = NOT STATISTICALLY SIGNIFICANT; N.C. = NOT COMPUTED

CHAPTER VII

DISCUSSION OF FINDINGS

As the reader has noted earlier, this study has focused its attention on four central issues vis-a-vis the use of remedial-compensatory courses at EPCC. These are: (1) How reliable, useful, and valid are the placement instruments used at EPCC? (2) Are remedial-compensatory courses at EPCC necessary, and, if so, are they doing the job they were designed to do? (3) How much are these Skills courses costing at EPCC? (4) Were other data known at admissions time related significantly to compensatory or 100-level course success?

The EPCC Placement Instruments

Effective October, 1975, entering EPCC students are required to take the placement tests; with few exceptions, those tests are not waived. These tests include: (1) the SRA Diagnostic Reading Test, (2) the Mathematics Placement Test Battery, and, (3) a short composition to determine the student's functional level in English.

The reliability coefficients of the reading and mathematics tests are very high (in excess of .80), indicating that these instruments contain high internal consistency. It is not presently possible to determine a reliability coefficient for English selection criteria, since the factors used for compensatory education or 100-level English course placement were not capable of quantification.

The validity aspects of these instruments are more complicated to assess. The content for the mathematics and reading tests are deemed appropriate by the respective EPCC departmental faculty. This agreement suggests that the instruments contain high content validity for student

course placement. Similarly, high content validity must be assumed for the subjective protocols currently employed for the English Placement Test, since most Skills and other departmental English teachers seem satisfied that the majority of the students placed in their respective classes belong at the level at which they were placed.

The crucial validity component for placement tests is that of predictive validity. In other words, is a given score made on the placement test indicative of success in a college-level course in that same academic discipline? The correlations between placement test scores and both success in compensatory and 100-level courses fall mostly within the moderate range (.25-.50). The research on academic prediction of success nationwide suggests that the most effective predictive instruments have correlations with future course success within the .40-.60 range. Used against this national criterion, most of the obtained correlations between placement scores and success at both compensatory and 100-level course grades fall within that range.

It is further interesting to note that when all three placement scores, plus two other variables available at admissions (Total Formal Education and Years Since High School Graduation),are correlated with success in compensatory and 100-level course success, the highest correlation obtained often is not that for the particular placement test score but for one of the other four predictors. This finding makes a strong case for using multiple correlational techniques to enhance both the validity of the placement tests battery and also the more accurate prediction of future student course grades. It was possible to compute the Pearson product-moment correlations (using the University of Colorado at Colorado Springs' Computer Terminal) when the number of comparisons available from

course to course varied. The multiple correlational program, however, either requires complete data for all variables, or some pre-determined constant, or the harmonic mean value to be inserted for missing values for multiple correlational analysis. A future prediction sample could be selected to provide the wide variety of student scores for valid remedial-compensatory and 100-level course success prediction. Such a study would require other than the normal random sampling techniques employed in this study for optimum prediction purposes.

Suggestions for Change

A. READING PLACEMENT TEST: At present, only the RC score is used for placement purposes in reading courses. It is recommended that both the 40-item Reading Comprehension Composite Score and the 60-item Vocabulary Score also be used for reading as well as English and mathematics course placement.

B. MATHEMATICS PLACEMENT TEST BATTERY (MPTB): The present form of the test battery appears to have high reliability. However, the administrative procedures for the test leave much to be desired from a psychometric point of view. Presently, students can say,"I already know how to manipulate whole numbers,"and not take Part I. They then can take Part II,or Parts II and III, or even Parts II, III, and IV. The scores they achieve on each part is written on a form, and their total score is added. Depending upon the various scores made on different parts of the test, the student is placed into a compensatory or 100-level mathematics course. From a practical standpoint, the present procedures appear to work. From a psychometric standpoint, the procedure is a nightmare. For this study, for example, research assistants

looked up the counseling records for all subjects in the study. From these counseling records, they copied the total number of points accrued by each student as that student's Mathematics Placement Test Score. Let's say you had two students who had Mathematics Placement Test Scores such that Student A's score is 17 and Student B's score is 13. Let's also say that Student A took only Part I, and that Student B did not take Part I, but made a score of 7 on Part II and 6 on Part III. Clearly, Student B's mathematics achievement has exceeded that of Student A. But what do you do? Do you arbitrarily inflate Student B's score by 20 points for the Part I he did not take? (In fact, if Student B really took Part I, would he have made a perfect score of 20? He didn't make perfect scores on the two parts of the test which he did take!) For the predictive validity part of this study, Student A would have been superior to Student B; and the low predictive validities obtained with the present MPTB scoring procedure reflect this anomaly.

It is recommended that the present four part, 80-item instrument be shortened to a 50-item test. The first 10-items can be gleaned from the present Part I. Items 11-20 should be representative items of the present Part II. Similarly, items 21-35 and 36-50 can be representative items from the present Parts III and IV. Unless waived, every entering EPCC student would be required to take the entire 50-item Mathematics Placement Test. Scores for each part and the total test can be recorded. This procedure is more in harmony with nationally-accepted testing protocols than is the present EPCC mathematics schemata.

C. ENGLISH PLACEMENT TEST: Each entering EPCC student is asked to write a short composition on a topic of his choosing. This composition is

then read by the EPCC Testing Office on the basis of organization of theme, support of main ideas, spelling, and proper use of grammar, syntax, etc.. On the basis of this review, the student is placed in a compensatory or 100-level English course. Although the composition scoring protocols have inferential suggestions for course placement, specific student scores for each protocol are not quantified. For the present study, English placement scores were generated as a function of assignment in English courses as follows: 1=Enl 010, 2=Enl 020, 3=Enl 050, and 4=Enl 100.

It is recommended that a descriptive rating scale be developed so the entering EPCC student's written composition will be more objectively scored. It is further suggested that this rating scale be developed jointly by faculty members of the Skills and English Departments. Such an objective instrument will assure future entering EPCC students that their English functioning level will be accurately assessed regardless of who scores the composition.

D. OTHER SUGGESTIONS: From our analyzing the entire data of the study, these two suggestions emerge:

(1) Use every quantifiable bit of information known at admission time for initial student placement in mathematics, reading, and English courses. This suggestion implies that the Mathematics Score, English Score, three Reading Scores, Formal Education, and Years Since High School Graduation data be incorporated into multiple regression equations. It was also found that placement test scores were significantly different when entering students were classified by sex. Therefore, multiple correlations and corresponding multiple

regression equations would need to be generated for entering EPCC female and male students.

(2) After the above suggestion has been implemented, it would be possible for EPCC Testing personnel to prepare an 80-column data processing record on each entering student. This data card would contain the following: Student Name; Social Security Number; Mathematics, English, and three Reading Placement Scores; Formal Education Prior to Admission; Years Since High School Graduation; Sex; and Anticipated Student Major at EPCC. Based upon the multiple regression equations generated in the first suggestion, a comprehensive computer program capable of being run on EPCC's computer could be developed which would yield a one page computer printout per student containing the following information:

- Raw Scores on Placement Tests.
- EPCC norms for each of these Raw Scores (National Norms also for the three Reading Scores).
- Course placement in Skills or 100-level mathematics, reading, and English courses.
- Expectancy that a student will make the grade of C, B, and A for each course placement by academic major.

It is also suggested that the output for this program be printed on 5-part paper. One copy of the printout would be given to the student during his initial counseling, placement, and registration sessions with EPCC counselors. The second copy would be retained in the EPCC counseling center. The third copy would be incorporated into the comprehensive student record maintained by the EPCC Registrar. The fourth copy would be retained on file at the EPCC Testing Center. The fifth copy would be provided to the

academic department in which the student indicated a major.

Operationally, the procedure could work like this. A student schedules himself to take the placement tests at the EPCC Testing Center. At that time, the student is scheduled to meet with an EPCC counselor two days after the testing date. The student takes the tests on the appointed date. The following day, the tests are scored,and data cards are punched. A member of the EPCC testing office then leaves the cards at the EPCC computer center for late evening processing. The next day, a designated EPCC testing person retrives both the data cards and the printout from the previous evening's computer processing. Two copies of the printout are provided to the EPCC counseling center for the day's counseling schedule, and the third copy is presented to the EPCC Registrar for incorporation into the student's comprehensive records. The fourth copy would be retained at the testing center. The fifth copy would be sent to the student's stated major department for file. The student data cards would be retained in the EPCC Testing Center and used periodically on the UCCS Computer to determine the stability of the EPCC norms from time to time.

If desired, a card punch printout also could be obtained. These cards would have the basic data as well as predicted numeric grades in remedial-compensatory and 100-level courses. The deck would be retained at the EPCC Testing Center. When the actual student course grades became available, the course grade could be punched on these cards. Future correlation between the predicted and actual course grades would provide EPCC administrators with

evidence of the validity of the initial multiple correlation. When these two correlations vary statistically, the time has arrived to redetermine new multiple correlations and multiple regression equations.

Compensatory Education at EPCC: Is It Necessary? Does It Work?

The prime emphasis in the major study on a 10% sample of EPCC enrollees for the last three academic years was to seek answers to whether compensatory education is necessary at EPCC and if it works.

Based on the reliability study sample, it was determined that 98.13%, 69.59%, and 80.91% of entering students for AY 73-74, 74-75, and 75-76 had placement test scores in mathematics, English, and reading which indicated a need for one or more compensatory courses before they had the appropriate background to pursue the 100-level courses.

Perhaps the magnitude of need for a Skills Studies program for entering EPCC students is best grasped if one analyzes the sub-scores of the SRA Diagnostic Reading Test (DRT), since this test has national norms. The 220 students in the reliability sample scored at: the 38%ile for Reading Rate (Words per minute), 14%ile in Vocabulary, 19%ile in Total Comprehension, 12%ile in Total Score, and 28%ile for their RC score. This finding, in part, is supported by Le Beau (1974). The national norms for the DRT resulted from the testing of 16,604 college freshman students in 1953. The national and EPCC norms for the reading test are contained in Appendix D. Although it is recognized that community colleges, as a function of their educational objectives, tend to draw a student clientele whose academic talents function at less than a parity level than their four or more year institutional counterparts, community college students are nevertheless

required to take first and second year college-level courses. According to the psychological notion of "readiness," a student will tend to be academically successful in "higher-order" educational pursuits only after he has mastered "lower-order" basic concepts.

The reading data cited above provide the reader with incontrovertible evidence that the average entering EPCC student is not educationally prepared to handle courses which require college-level reading ability. The variation of reading underachievement differs widely from students who fail to understand basic phonics (lower elementary grade reading skills) through students who function at the junior or senior high school reading levels.

Human reaction to these facts also tends to vary widely, depending upon the primary role that various people play in their everyday life. The surface reader might respond, "What an indictment of public elementary and secondary education, when striking school teachers carry picket signs which say 'Teachers want to Teach.'" A realist might say, "We've known about individual differences in learning ability for years. These data merely validate this notion." Public school administrators might suggest that, in keeping with a San Francisco legal decision, a school district cannot be held accountable if it presents a high school diploma, when, after graduation, the graduate is found to be functionally illiterate (not able to read and write at the fifth grade level). Politicians might react with righteous indignation with such a comment as, "The people already paid once for this student to learn these basic skills; why must they pay again?"

Verbal diatribe aside, the fact is that students who score below the college level on reading and other placement tests need some help if they are to be able to attend and to be successful in community college transfer

and career programs. This conclusion is shared by Engdahl (1975), Roueche and Kirk (1973), and Bernal (1973) who demonstrated that such help is needed and that most community colleges provide this assistance in the form of remedial-compensatory courses in mathematics, English, and reading. And, so it is also at El Paso Community College.

In the major portion of this study, the entering scores of students were compared and contrasted by age, sex, ethnic characteristics, and preferences for an academic major at EPCC. Upon admission, EPCC students do vary according to these four general criteria. Formal Education, Years Since High School Graduation,as well as the Mathematics, English, and Reading Placement Scores were different. There was no evidence of any related literature which studied compensatory programs using these variables. The uniqueness of this study seems evident.

Those students who could benefit from remedial-compensatory courses were so registered, and their grades in these courses were examined according to the above criteria. Except for sex and some age categories, the majority of the compensatory course grade comparisons were not statistically significant.

Grades on the 100-level courses in mathematics, English, and reading were similarly analyzed. Except for sex, none of the other comparisons was significant.

How can one account for the fact that students who differed significantly on their initial academic functioning levels in mathematics, English, and reading were not different in achievement when their 100-level course grades were compared? There are two answers to this question: (1) The scope and sequence of the curriculum for compensatory courses at EPCC, and

(2) the Skills Department faculty. The 100-level course grades made by Skills students confirms the validity of the compensatory course emphasis. Similar conclusions regarding the validity of compensatory courses were likewise reached by Grizzle (1975), Scheer (1975 a;b), Lodewick (1975) and others.

The ability of the Skills faculty constitutes the second part to the above question. Curricular activities and learning are acquired by compensatory students through the talent and individual help of teachers. EPCC is fortunate to have a highly talented and dedicated Skills Department faculty who teach these remedial-compensatory students. The data show that they are able to take students whose functioning levels and talents vary considerably, provide individualized help within a group learning context to assist these students in raising their achievement in mathematics, English, and reading to collegiate levels, and have the graduates compete effectively with their non-compensatory EPCC student peers in 100-level courses. For the most part, entering compensatory students can complete their 100-level courses in mathematics, English,and reading within one calendar year after admission to EPCC. This achievement of one year turnaround time for compensatory students represents a positive example that an equal educational opportunity exists for all EPCC students enrolled in Skills courses.

Thus, there is a substantial need for remedial-compensatory courses by entering EPCC students. Presently, these needs are being met, and students who complete the Skills course sequences not only achieve well in 100-level course grades but also are academically competitive with their non-compensatory EPCC student peers. This finding is shared by Lodewick (1975)

and Scheer (1975,a) who both made a similar conclusion regarding their students at Richland College.

A discussion of the need for and success of compensatory education at EPCC would not be complete unless some mention is made of the level of support which the Skills Department has from other academic departments in an institution which is experiencing a student population explosion. The student FTE for compensatory education increased 2.2% for the three budget years from FY 75-77, while the institutional student FTE increased 29.84%. To merely maintain parity, administrative support should be provided to allow compensatory education to recoup this loss, and at that time to be in balance with the institutional increase or decrease in future student FTE. After parity has been attained, the administration should establish a desired level of satisfying future EPCC student compensatory needs as one of its short and long range budgetary planning factors.

Cost of Compensatory Education at EPCC

Between FY '75 and '77, the Remedial Instructional Budget increased 69.04% from $273,199 to $461,809 -- while the student-faculty ratio declined from 29:1 to 21:1. The student FTE generated by this reduction in student-faculty ratio experienced a 2.2% increase in services for remedial-compensatory students.

This rather constant student FTE generated by remedial instruction over the three years, coupled with the decline in student-faculty ratio, caused the cost/remedial student to increase 65.41%,from $507.63 in FY '75 to $839.65 in FY '77. During this same period the total institutional cost/student rose 42.51%,from $941 in FY '75 to $1341 in FY '77. Although the comparative cost/student gain numerically suggests that the remedial

instruction was advancing at a rate more than 50% more than the institutional cost/student increase, the proportionate cost/student for remedial and total institutional student FTE rose approximately 9%, from 53.95% in FY '75 to 62.61% for FY '77.

These cost comparisons suggest that approximately 8 compensatory student FTE's can be educated for the cost of 5 total institutional student FTE's. Since the student need for compensatory education is high, and the cost/student to educate compensatory students is considerably lower than the total institutional cost/student FTE, it would seem that the compensatory student FTE could be significantly increased while the total institutional cost/student FTE would enjoy a financial decline. This generalization not only makes fiscal sense, but it also is a way to provide for greater student services across all the academic departments while conserving both manpower and other resources. In other words, the more students with compensatory needs that can be sequenced through Skills courses, the greater the number of full time EPCC students who will be eligible to take course sequences in the other eight academic departments.

Again, administrative planning and other factors must be undertaken to determine the optimum increase in compensatory student FTE which will correspondingly stimulate the student FTE in the other academic departments to remain within the fiscal, scheduling, and space limitations available at EPCC for any given academic year.

Other Comparisons of the EPCC Data

As the research design of this study was being coordinated with the EPCC administrative staff, concern was expressed whether one or more "other" variables might be operating with respect to the EPCC compensatory student.

In addition to the age, sex, ethnic characteristics, and EPCC field of study variables used in the major study, these other variables included pupil type (civilian, military-in-service, and VA or VA dependent), employment status at enrollment (fully employed, part-time employed,and not employed), student financial status (socially and economically disadvantaged, physically handicapped, mental/emotionally disadvantaged, combination of foregoing categories, and none), and residency status (in-state and out-of-state).

Although placement scores varied significantly, there were no statistically significant differences in grades made in compensatory or 100-level courses across comparisons for any of these variables. In other words, success at EPCC is independent of an entering student's type, employment status, financial status,or residency. This finding further supports the notion that equal educational opportunities exist for all students enrolled in 100-level courses in mathematics and English throughout all EPCC academic departments.

Based on the evidence in this study, El Paso Community College certainly qualifies as a "second chance" institution. Whether the College continues to support this position must remain the decision of those who administer and finance its programs. For students who need EPCC's remedial-compensatory program, only continued support will allow them this "second chance."

APPENDIX A

Ease Indexes for Mathematics and Reading Placement Tests (An Ease Index Represents the Proportion of Students Who Scored Correctly on a Test Item)

TABLE A-1

EASE INDEXES FOR 36-ITEM MATHEMATICS PLACEMENT TEST BATTERY 1969-71 (N=145)

ITEM	p.	ITEM	p.	ITEM	p.	ITEM	p.
1	.745	10	.641	19	.124	28	.062
2	.591	11	.372	20	.179	29	.103
3	.531	12	.579	21	.248	30	.103
4	.690	13	.283	22	.283	31	.028
5	.359	14	.538	23	.145	32	.028
6	.503	15	.317	24	.324	33	.076
7	.538	16	.441	25	.379	34	.041
8	.455	17	.352	26	.145	35	.034
9	.400	18	.207	27	.179	36	.007

TABLE A-2

EASE INDEXES FOR 80-ITEM MATHEMATICS PLACEMENT TEST BATTERY (1971-75)

ITEM	PART I (N=230)	PART II (N=55)	PART III (N=12)	PART IV (N=9)
	p.	p.	p.	p.
1	.930	.836	.833	.667
2	.809	.855	.167	.333
3	.743	.546	.333	.556
4	.626	.564	.000	.667
5	.717	.618	.417	.556
6	.565	.219	.250	.556
7	.574	.164	.000	.444
8	.374	.219	.833	.444
9	.439	.418	.667	.000
10	.552	.309	.583	.000
11	.483	.273	.833	.778
12	.270	.345	.333	.667
13	.491	.564	.417	.444
14	.300	.145	.250	.667
15	.257	.000	.333	.000
16	.130	.180	.417	.000
17	.543	.273	.250	.778
18	.735	.218	.583	.222
19	.409	.000	.500	.667
20	.491	.436	.250	.444

TABLE A-3

E SE INDEXES FOR ITEMS ON THE DIAGNOSTIC READING TEST

ITEM	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1969-75
	N=67	N=72	N=75	N=72	N=75	N=73	N=434
1	.552	.528	.613	.528	.507	.479	.535
2	.612	.611	.627	.639	.520	.616	.604
3	.666	.708	.760	.736	.747	.753	.728
4	.891	.903	.907	.972	.920	.890	.912
5	.731	.708	.787	.736	.720	.712	.733
6	.474	.431	.547	.611	.467	.479	.500
7	.843	.861	.880	.833	.880	.822	.853
8	.401	.167	.427	.403	.373	.356	.353
9	.701	.694	.747	.750	.760	.836	.749
10	.701	.722	.747	.889	.693	.836	.765
11	.701	.694	.747	.833	.720	.822	.753
12	.772	.694	.813	.764	.827	.795	.776
13	.772	.556	.680	.750	.747	.603	.682
14	.758	.629	.680	.764	.720	.685	.700
15	.552	.583	.587	.569	.613	.671	.597
16	.821	.806	.880	.889	.853	.808	.843
17	.701	.625	.653	.417	.693	.644	.622
18	.672	.583	.653	.514	.613	.548	.597
19	.507	.629	.573	.542	.480	.493	.535
20	.716	.667	.613	.667	.613	.616	.647

TABLE A-3 (CONTINUED)

ITEM	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1969-75
	N=67	N=72	N=75	N=72	N=75	N=73	N=434
21	.881	.931	.907	.861	.853	.877	.885
22	.985	.972	.987	.986	.987	.973	.954
23	.985	.944	.960	.931	.973	.932	.954
24	.925	.806	.760	.861	.893	.753	.832
25	1.000	.917	.973	.986	.973	.973	.970
26	.896	.833	.907	.903	.827	.849	.869
27	.985	.958	.933	.944	.947	.959	.954
28	.985	.958	.960	.972	.973	.973	.970
29	.940	.931	.853	.931	.947	.890	.915
30	.821	.792	.813	.903	.773	.780	.813
31	.761	.764	.680	.694	.627	.671	.698
32	.746	.653	.693	.653	.627	.685	.675
33	.851	.819	.920	.833	.747	.808	.829
34	.746	.792	.600	.694	.480	.534	.638
35	.940	.903	.920	.931	.880	.877	.908
36	.955	.903	.880	.931	.853	.849	.894
37	.940	.944	.920	.986	.947	.959	.949
38	.910	.847	.853	.806	.867	.836	.853
39	.925	.917	.947	.972	.960	.973	.949
40	.821	.861	.827	.889	.907	.808	.853

TABLE A-3 (CONTINUED)

ITEM	1969-70 N=67	1970-71 N=72	1971-72 N=75	1972-73 N=72	1973-74 N=75	1974-75 N=73	1969-75 N=434
41	.731	.778	,720	.792	.680	.767	.744
42	.791	.819	.800	.833	.853	.712	.802
43	.418	.472	.467	.500	.533	.438	.472
44	.925	.917	.907	.958	.920	.959	.931
45	.896	.875	.867	.875	.747	.822	.846
46	.582	.569	.480	.431	.387	.452	.482
47	.896	.917	.920	.944	.827	.918	.903
48	.836	.819	.880	.847	.773	.849	.834
49	.955	.861	.933	.875	.880	.863	.894
50	.403	.458	.400	.264	.240	.219	.329
51	.597	.611	.413	.431	.213	.342	.431
52	.821	.833	.827	.764	.640	.685	.760
53	.821	.819	.747	.792	.707	.740	.770
54	.746	.736	.773	.569	.440	.438	.615
55	.612	.569	.627	.556	.467	.507	.555
56	.746	.694	.747	.736	.627	.589	.689
57	.731	.778	.800	.764	.600	.589	.710
58	.687	.625	.707	.625	.507	.521	.611
59	.701	.667	.627	.583	.467	.589	.604
60	.552	.458	.547	.417	.427	.425	.470

TABLE A-3 (CONTINUED)

ITEM	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1969-75
	N=67	N=72	N=75	N=72	N=75	N=73	N=434
61	.433	.569	.533	.431	.267	.329	.426
62	.284	.417	.453	.278	.227	.247	.318
63	.493	.417	.533	.417	.293	.329	.412
64	.388	.361	.533	.292	.227	.233	.339
65	.448	.458	.600	.403	.320	.274	.417
66	.358	.319	.467	.250	.253	.274	.320
67	.343	.333	.453	.250	.173	.192	.290
68	.149	.083	.253	.097	.107	.068	.127
69	.269	.264	.360	.236	.133	.137	.233
70	.284	.278	.467	.208	.173	.110	.253
71	.239	.222	.320	.181	.107	.082	.191
72	.104	.153	.200	.125	.027	.027	.106
73	.149	.167	.387	.167	.093	.068	.173
74	.194	.194	.267	.083	.067	.027	.138
75	.194	.208	.333	.125	.093	.082	.173
76	.134	.153	.280	.111	.093	.082	.143
77	.164	.194	.253	.069	.107	.082	.145
78	.134	.125	.160	.028	.040	.041	.088
79	.164	.167	.173	.056	.093	.082	.122
80	.149	.167	.200	.069	.107	.082	.129

TABLE A-3 (CONTINUED)

ITEM	1969-70 N=67	1970-71 N=72	1971-72 N=75	1972-73 N=72	1973-74 N=75	1974-75 N=73	1969-75 N=434
81	.642	.639	.693	.653	.587	.616	.638
82	.851	.861	.787	.819	.680	.808	.800
83	.910	.931	.920	.944	.920	.918	.970
84	.612	.556	.480	.444	.400	.479	.493
85	.806	.722	.747	.764	.573	.685	.714
86	.746	.750	.760	.736	.693	.712	.733
87	.851	.792	.800	.806	.733	.753	.788
88	.672	.694	.733	.694	.653	.616	.673
89	.896	.875	.907	.931	.907	.904	.903
90	.746	.694	.760	.792	.760	.753	.620
91	.045	.056	.093	.083	.053	.055	.065
92	.866	.764	.827	.806	.760	.781	.800
93	.910	.819	.813	.778	.640	.699	.774
94	.896	.833	.933	.917	.773	.849	.866
95	.731	.542	.680	.694	.587	.589	.636
96	.552	.583	.547	.472	.453	.507	.518
97	.381	.431	.333	.292	.267	.342	.339
98	.394	.528	.373	.403	.227	.219	.355
99	.448	.514	.507	.361	.267	.274	.394
100	.544	.542	.400	.347	.253	.384	.408

APPENDIX B

Correlational Matrices on Nineteen Variables for Students Who Took Placement Tests, and on Sixteen Variables for Students Who Did Not

Table B-1

CORRELATIONS ON 19 VARIABLES FOR 875 EPCC SAMPLE STUDENTS WITH SELECTION SCORES (1972-75)

VARIABLES	CORRELATION MATRIX																		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1. Highest Grade Completed	1.000	.084 (618)	-.052 (716)	.176 *** (783)	.189 *** (775)	.178 *** (769)	.154 * (192)	.317 *** (154)	.099 (44)	.093 (184)	.058 (33)	.017 (71)	.136 (111)	.105 * (301)	-.087 (39)	.155 * (113)	.170 * (113)	-.041 (50)	-.041 (74)
2. Grade Point Average EPCC		1.000	.000 (556)	.287 *** (606)	.322 *** (601)	.229 *** (594)	.326 *** (168)	.307 *** (141)	.433 ** (39)	.501 *** (165)	.492 ** (31)	.298 ** (67)	.458 *** (93)	.563 *** (270)	.223 (40)	.366 *** (99)	.300 *** (105)	.238 * (47)	.273 ** (75)
3. Years Since High School Graduation			1.000	-.040 (715)	-.114 *** (715)	-.078 * (710)	-.044 (182)	-.107 (141)	-.057 (35)	-.079 (167)	-.120 (34)	-.108 (70)	.100 * (92)	-.017 (251)	.170 (43)	.126 (94)	.048 (102)	-.231 (47)	-.271 ** (76)
4. English Selection Score				1.000	.505 *** (792)	.254 *** (774)	.140 * (189)	.293 *** (146)	.314 * (41)	.337 *** (174)	.042 (28)	.136 (73)	.087 (110)	.230 *** (298)	.071 (38)	.089 (106)	.063 (111)	.055 (44)	.172 (72)
5. Reading Selection Score					1.000	.335 *** (779)	.121 * (195)	.310 *** (150)	.251 (41)	.441 *** (181)	-.207 (32)	.106 (71)	.243 ** (106)	.212 *** (294)	.091 (43)	.076 (110)	.041 (111)	.169 (46)	.186 (75)
6. Math Selection Score						1.000	.188 ** (186)	.407 *** (140)	.180 (44)	.293 *** (179)	.319 * (31)	.257 * (66)	.119 (101)	.150 ** (277)	.204 (43)	.027 (104)	.134 (104)	.284 * (41)	.045 (75)
7. Mat 010							1.000	.166 (67)	.351 (12)	.119 (49)	.242 (24)	.008 (53)	.140 (59)	.394 *** (82)	.092 (22)	.258 * (73)	.118 (72)	.464 * (20)	.287 * (51)
8. Mat 020								1.000	.366 * (34)	.392 *** (65)	-.344 (16)	-.124 (33)	.112 (49)	.202 * (87)	.344 * (24)	.291 * (46)	.349 ** (46)	.157 (24)	.251 (43)
9. Mat 030									1.000	.431 * (25)	.000 (1)	.293 (6)	.120 (18)	.579 *** (28)	.000 (5)	.389 (8)	.311 (11)	.167 (7)	.612 * (9)
10. Mat 100										1.000	.603 (8)	.311 (18)	.275 * (38)	.315 *** (100)	-.016 (17)	-.023 (32)	-.046 (37)	.000 (23)	.233 (22)
11. Enl 010											1.000	.888 *** (11)	-.066 (6)	.381 (12)	.252 (11)	.234 (12)	-.073 (11)	.192 (6)	.373 (14)
12. Enl 020												1.000	.739 *** (27)	.190 (28)	-.016 (22)	.340 (38)	.287 (31)	.535 * (8)	.096 (34)
13. Enl 050													1.000	.527 *** (62)	-.088 (9)	.490 ** (40)	.144 (52)	.486 * (20)	-.021 (31)
14. Enl 100														1.000	.307 (18)	.136 (59)	.191 (65)	.456 ** (32)	.563 *** (36)
15. Rea 010															1.000	.863 *** (17)	.465 * (16)	.655 * (8)	.060 (26)
16. Rea 020																1.000	.458 *** (44)	.333 (8)	.296 * (38)
17. Rea 050																	1.000	.414 (29)	.028 (35)
18. Rea 101																		1.000	-.050 (16)
19. Enl 030																			1.000

* p = .05; ** p = .01; *** p = .001

Table B-2

CORRELATIONS ON 16 VARIABLES FOR 534 EPCC SAMPLE STUDENTS WITH NO SELECTION SCORES (1972-75)

VARIABLES	CORRELATION MATRIX															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. HIGHEST GRADE COMPLETED	1.000	.185*** (421)	.058 (480)	.185 (42)	-.089 (41)	.261 (11)	.248** (98)	-.027 (11)	.357 (9)	.177 (19)	-.036 (116)	-.179 (12)	.303 (18)	.224 (23)	.121 (14)	.122 (27)
2. EPCC GRADE POINT AVERAGE		1.000	.102* (392)	.326* (39)	.397** (36)	.763** (10)	.519*** (86)	.356 (11)	.721 (8)	.753*** (17)	.464*** (104)	.585* (12)	.528* (16)	.336 (21)	.588 (13)	.445* (27)
3. YEARS SINCE HIGH SCHOOL GRADUATION			1.000	.213 (40)	.102 (40)	.102 (11)	.072 (93)	.175 (11)	-.189 (9)	-.004 (17)	-.007 (109)	.177 (12)	.323 (19)	-.247 (23)	.284 (13)	-.025 (27)
4. MAT 010				1.000	.394 (14)	.000 (2)	-.131 (14)	.875* (5)	.000 (4)	-.258 (7)	.226 (21)	.463 (6)	.636** (13)	-.186 (10)	.000 (3)	.189 (15)
5. MAT 020					1.000	.577* (9)	.409* (17)	.000 (3)	.577 (4)	.301 (8)	.042 (21)	1.000 (2)	.000 (5)	-.370 (7)	.000 (2)	.529 (9)
6. Mat 030						1.000	-.426 (4)	.000 (1)	.000 (1)	.000 (1)	.091 (4)	.000 (1)	1.000 (2)	1.000 (2)	.000 (1)	.000 (1)
7. Mat 100							1.000	-.378 (6)	-.133 (4)	.783** (8)	.259* (46)	.294 (5)	-.297 (9)	.395 (11)	.791* (5)	-.151 (11)
8. ENL 010								1.000	1.000 (2)	.000 (2)	.000 (3)	.853 (4)	.000 (6)	.000 (2)	.000 (1)	.218 (6)
9. ENL 020									1.000	.612 (5)	-1.000*** (4)	1.000 (2)	-.500 (3)	.102 (5)	.000 (2)	.870 (4)
10. ENL 050										1.000	.206 (9)	.000 (2)	.415 (6)	.158 (9)	.000 (4)	.400 (7)
11. ENL 100											1.000	.884** (6)	.413 (8)	-.162 (13)	-.539 (8)	.633** (15)
12. REA 010												1.000	.000 (3)	.577 (4)	.000 (1)	.590 (7)
13. REA 020													1.000	.152 (11)	.000 (3)	.365 (9)
14. REA 050														1.000	.091 (7)	.324 (13)
15. REA 101															1.000	1.000*** (5)
16. ENL 030																1.000

* p = .05; ** p = .01; *** p = .001

APPENDIX C

Raw Data on Nineteen Variables for Students Majoring in Departments in General Studies and Occupational Studies

Table C-1
Raw Data on 19 Variables for General Studies Students

	GENERAL STUDIES (N=295)											
	COMMUNICATIONS & HUMANITIES (N=39)			MATHEMATICS & SCIENCE (N=61)			SKILLS STUDIES (N=36)			SOCIAL SCIENCES (N=159)		
	N	MEAN	STD DV	N	MEAN	STD DV	N	MEAN	STD DV	N	MEAN	STD DV
1. Highest Grade Completed	39	12.31	.95	60	12.38	.90	30	11.57	1.10	159	12.18	1.02
2. EPCC GPA	36	3.07	.61	47	3.19	.53	26	3.20	.54	130	3.14	.57
3. Yrs Since HS Graduation	27	10.33	11.30	52	8.77	8.39	33	10.73	10.11	135	10.79	10.41
4. Enl Selection Score	24	3.25	.74	29	3.34	.55	27	2.63	.79	101	3.19	.74
5. Rea Selection Score	23	207.17	113.10	29	197.90	67.74	29	122.66	64.27	94	201.57	80.26
6. Mat Selection Score	23	12.96	6.71	31	14.26	7.33	28	8.64	5.63	90	12.59	10.56
7. Mat 010	6	93.33	4.08	6	93.33	4.08	12	90.00	5.22	33	88.03	6.84
8. Mat 020	7	87.86	7.56	17	92.65	4.37	10	83.00	9.19	24	85.00	9.33
9. Mat 030	3	85.00	10.00	9	87.22	8.33	2	75.00	.00	9	87.22	8.33
10. Mat 100	5	85.00	14.14	17	87.94	9.20	3	85.00	10.00	18	83.89	6.76
11. Enl 010	1	75.00	.00	0	--	--	1	95.00	.00	4	70.75	42.10
12. Enl 020	3	88.33	5.77	3	91.67	5.77	11	85.00	6.32	9	73.78	27.77
13. Enl 050	9	86.11	6.01	6	88.33	5.16	8	88.75	5.18	26	87.50	10.32
14. Enl 100	12	85.00	9.53	29	85.00	8.45	6	70.50	31.52	64	85.16	8.64
15. Rea 010	1	95.00	.00	0	--	--	5	76.00	16.73	1	95.00	.00
16. Rea 020	6	93.33	4.08	2	85.00	.00	10	94.00	3.16	14	90.00	6.50
17. Rea 050	6	88.33	8.17	8	93.75	3.54	6	83.33	7.53	17	90.29	6.24
18. Rea 101	4	95.00	.00	8	93.75	3.54	2	95.00	.00	7	90.71	5.35
19. Enl 030	3	88.33	5.77	7	87.86	9.51	9	87.22	10.93	9	90.56	7.26

Table C-2
Raw Data on 19 Variables for Occupational Studies Students

	OCCUPATIONAL STUDIES (N=1102)														
	Business & Office Occupations (N=282)			Community & Service Occupations (N=229)			Health Occupations (N=79)			Industrial Occupations (N=237)			Technical Occupations (N=275)		
	N	MEAN	STD DV	N	MEAN	STD DV	N	MEAN	STD DV	N	MEAN	STD DV	N	MEAN	STD DV
1. Highest Grade Completed	278	12.27	1.01	219	12.21	1.17	73	12.27	1.10	219	11.97	1.09	261	12.22	.90
2. EPCC GPA	213	3.14	.57	164	3.01	.61	67	3.10	.50	171	3.17	.56	208	3.14	.56
3. Yrs Since HS Graduation	260	13.49	10.43	200	13.24	10.62	66	13.97	15.48	219	12.28	11.17	253	10.59	8.58
4. Enl Selection Score	162	3.19	.77	123	2.98	.75	57	3.32	.74	141	2.75	.90	161	3.00	.87
5. Rea Selection Score	160	182.19	77.54	12[illegible]	164.86	70.72	55	179.27	73.56	141	151.75	77.74	168	166.49	74.81
6. Mat Selection Score	156	12.94	7.86	126	10.83	7.60	53	14.15	8.75	135	10.55	5.59	17[illegible]	12.11	6.74
7. Mat 010	40	90.00	6.41	29	87.07	9.02	17	89.71	6.24	48	88.33	8.08	52	90.77	6.37
8. Mat 020	42	88.81	8.25	14	85.43	7.70	8	88.75	7.44	22	86.82	9.07	57	87.11	8.61
9. Mat 030	8	93.75	3.54	4	87.50	[illegible].00	2	90.00	7.07	5	87.00	8.37	12	85.00	10.44
10. Mat 100	106	85.38	9.15	23	81.52	12.29	3	88.33	5.77	42	82.14	9.44	68	86.32	8.79
11. Enl 010	7	87.86	9.51	6	83.33	7.53	0	--	--	15	88.33	8.17	11	89.55	6.88
12. Enl 020	18	84.44	8.73	9	90.56	8.82	0	--	--	15	80.33	6.40	16	84.38	7.72
13. Enl 050	29	87.07	6.75	14	86.43	8.64	5	87.60	4.47	14	84.29	1.16	20	85.50	5.10
14. Enl 100	98	86.73	8.25	63	85.32	8.61	37	87.97	6.18	45	85.00	8.79	68	88.97	6.94
15. Rea 010	16	90.00	8.17	6	86.67	9.83	1	85.00	.00	11	83.55	25.20	15	87.67	7.99
16. Rea 020	31	92.74	5.60	14	90.00	8.55	12	90.83	6.60	22	85.68	10.94	23	89.78	7.30
17. Rea 050	29	92.24	4.55	18	91.67	4.85	10	86.00	7.38	18	90.00	7.07	25	90.20	7.14
18. Rea 101	14	92.29	2.67	10	90.00	7.07	5	89.00	8.94	6	90.00	5.48	8	95.00	.00
19. Enl 030	22	87.73	7.67	13	79.15	22.97	2	85.00	.00	19	89.21	6.07	22	88.18	8.39

APPENDIX D

National and EPCC Raw Data and
Norms for the Diagnostic Reading Test
Based Upon 220 Students in the 1972-75
Reliability Sample

TABLE D-1

MEANS, STANDARD DEVIATIONS, AND t TESTS ON READING DATA FOR THE RELIABILITY SAMPLE

YEAR	N	READING RATE (WORDS PER MINUTE)			VOCABULARY			TOTAL COMPREHENSION			TOTAL SCORE			RC RATE X COMPREHENSION		
		MEAN	STD DEV	% ILE	MEAN	STD DEV	% ILE	MEAN	STD DEV	% ILE	MEAN	STD DEV	% ILE	MEAN	STD DEV	% ILE
1969-72	214	276.18	79.42	45	37.91	11.15	27	26.37	7.83	21	64.48	17.71	21	185.30	83.65	35
1972-75	220	265.46	70.37	38	33.14	9.69	14	25.75	6.64	19	58.44	15.02	12	170.21	64.87	28
t TEST		1.49			4.75***			0.89			3.83***			2.10*		
PROBABILITY		.136			.001			.373			.001			.035		

df=432 *p. 05=1.96; **p. 01=2.58; ***p. 001=3.29

N.B. The EPCC norms contained in Table D-2 were derived from the frequency distributions reported in Table D-1. The RC mean score on students included in the major study was 172.20. The resulting t test of 0.39 was not statistically significant (p. 05=1.96); therefore, the EPCC derived norms in Table D-2 also appear to be representative for EPCC students in the major study.

TABLE D-2

NATIONAL AND EPCC NORMS BASED ON 220 STUDENTS IN THE RELIABILITY SAMPLE (N=220)
(EPCC NORMS ARE IN PARENTHESES)

NATIONAL PERCENTILE	WORDS PER MINUTE		VOCABULARY		TOTAL COMPREHENSION		TOTAL SCORE		RC (READING RATE TIMES COMPREHENSION		NATIONAL PERCENTILE
99-	475-	(514)	59-	(54)	39-	(36)	96-	(90)	456-	(355)	99-
95-	405-	(382)	56-	(50)	37-	(35)	92-	(82)	373-	(297)	95-
90-	370-	(347)	55-	(46)	36-	(34)	90-	(76)	333-	(252)	90-
80-	338-	(315)	52-	(41)	34-	(32)	86-	(72)	290-	(209)	80-
75-	325-	(305)	51-	(40)	34-	(31)	84-	(70)	273-	(198)	75-
70-	317-	(295)	49-	(38)	33-	(30)	83-	(67)	263-	(187)	70-
60-	296-	(276)	47-	(36)	32-	(28)	79-	(63)	236-	(171)	60-
50-	285-	(259)	44-	(33)	31-	(27)	76-	(60)	217-	(157)	50-
40-	269-	(243)	42-	(31)	29-	(25)	72-	(57)	194-	(141)	40-
30-	253-	(227)	39-	(28)	28-	(23)	68-	(51)	172-	(123)	30-
25-	245-	(219	37-	(26)	27-	(22)	66-	(49)	162-	(114)	25-
20-	235-	(211)	35-	(25)	26-	(20)	64-	(46)	150-	(104)	20-
10-	218-	(186)	31-	(21)	23-	(16)	57-	(38)	124-	(78)	10-
5-	200-	(164)	28-	(17)	20-	(13)	51-	(29)	102-	(55)	5-
1-	175-	(126)	21-	(11)	14-	(10)	39-	(22)	68-	(31)	1-
NATIONAL/EPCC AVERAGES	285 (259)		44 (33)		31 (27)		76 (60)		217 (157)		EPCC NATIONAL AVERAGES
NATIONAL/EPCC PERCENTILES											EPCC PERCENTILE

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